Order Number MOP00090015C2

# Service Manual

## Microwave Oven

INVERTER SYSTEM INSIDE

## NN-A880WB / NN-A850WB / NN-A850CB

## SPECIFICATIONS

### Specification

| | |
|---|---|
| Power Source | 240VAC Single Phase 50Hz |
| Power Requirements | Micro : 1300W Grill: 1560W Convection: 1330W Combination: 2480W |
| Output (IEC705-88) | Micro : 1000W Grill: 1400W Convection: 1200W |
| Microwave Frequency | 2450Mz |
| Timer | 99 Minutes 99 Seconds |
| Oven Cavity Size | 32L |
| Outside Dimensions | 530mm (W) x 508mm (D) x 344mm(H) |
| Inside Dimensions | 350mm (W) x 360mm (D) x 250mm(H) |
| Weight | 20.5Kg |
| | Specifications subject to change without notice |

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**⚠ WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic®

**IMPORTANT SAFETY NOTICE**

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

# 1. Inverter Warning

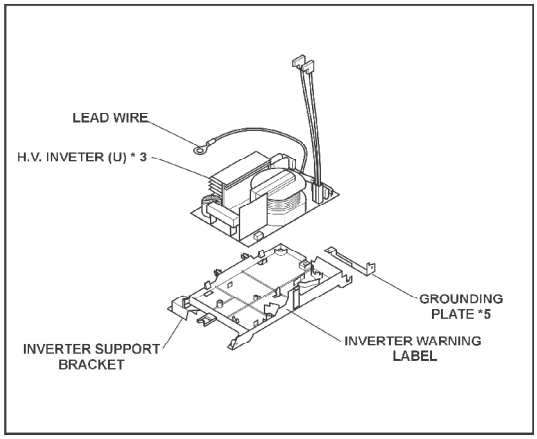
**The inverter board looks like a regular PCB, however, this PCB drives the magnetron tube using very high voltages and current.**
**It has**

1. **Very high voltage and high current**
2. **An Aluminium heat sink that becomes very hot**
3. **The capacitors on the inverter circuit will contain a high voltage charge even when the oven is not operating.**

**Do not**

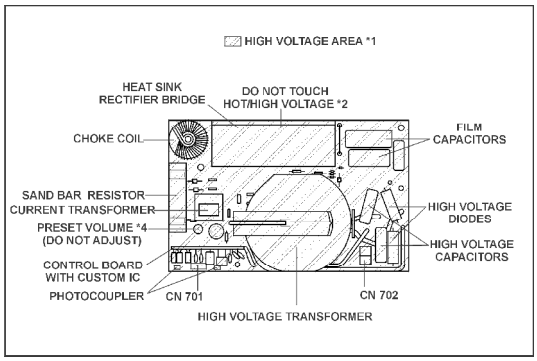
1. **Do not touch the circuitry as it contains very high voltages. When replacing the board please take extreme care to avoid possible electric shock. High voltages may remain in the circuit.**
2. **Do not touch the aluminium heat sink as it will become very hot. It also contains high voltages.**
3. **Do not attempt to repair the inverter PCB as this can be very dangerous. Replace the high voltage inverter circuit as a complete unit. Return the old unit fully repacked in the original shipping box and completed paper work.**
4. **Do not adjust or tamper with the preset volume on the inverter board. It is very dangerous to adjust this preset without proper test equipment.**
5. **Do not test the oven while the inverter grounding strip or screws are loose. It is very dangerous to operate the inverter circuit board without a proper ground connection.**

**Figure 1**




**Inverter Gounding**

**Figure 2**



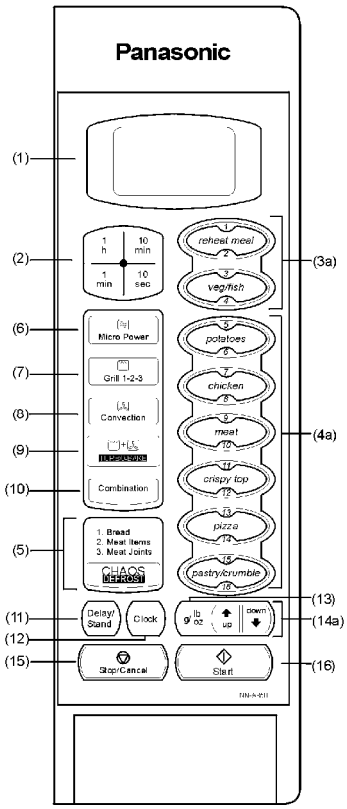

**Inverter PCB layout**

# 2. Feature Chart

| Function | NN-A880WB | NN-A850WB<br>NN-A850CB |
|---|---|---|
| Microwave | 6 | 6 |
| Grill | 3 | 3 |
| Convection | 17 | 17 |
| Combination | YES | YES |
| Sensor reheat | 2 | - |
| Sensor cook | 2 | - |
| Sensor combination | 4 | - |
| Weight defrost | 3 | 3 |
| Weight combination | 8 | 12 |
| Weight reheat | - | 2 |
| Weight cook | - | 2 |
| Stage cooking | 3 | 3 |
| Delay/Stand | YES | YES |
| More/Less | YES | NO |
| Kg-> lb/oz | YES | YES |
| Clock | 12H | 12H |
| Word prompt | English | English |
| Step by Step | LED | LED |

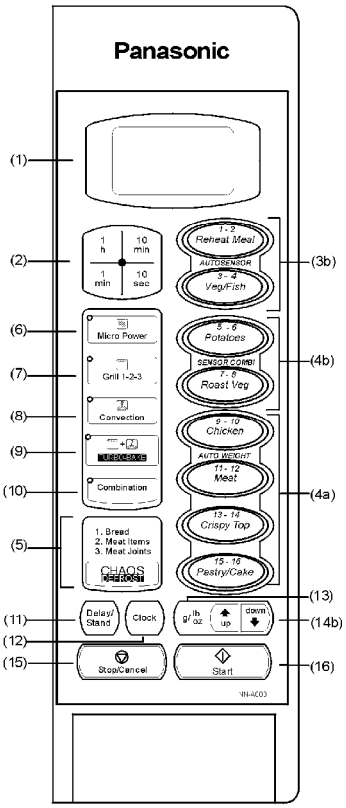
# 3. Control Panel

NN-A850




(1) **Display Window**
(2) **Time Pads**
(3a) **Auto Weight Microwave Programs**
(3b) **Auto Sensor Microwave Programs**
(4a) **Auto Weight Combination Programs**
(4b) **Auto Sensor Combination Programs**
(5) **Auto Weight Defrost Programs**
(6) **Microwave Power Setting**
(7) **Grill Setting**
(8) **Convection Pad**
(9) **TURBO-BAKE pad**
(10) **Combination Pad**
(12) **Clock Pad:**
This can be used to delay a cooking program for upto 9hrs 99 mins.
(13) **lb/oz Conversion Pad**
(14a) **Weight Selection Pad**
(14b) **More/Less Pad**
(15) **Stop/Cancel Pad:**
**Before Cooking:**
one press clears your instructions
**During cooking:**
one press temporarily stops the cooking program. Another press cancels all of your instructions and the time of the day will appear in the display.
(16) **Start Pad:**
Press to start operating the oven. If during cooking the door is opened or stop/camcel pad is pressed once, start pad has to be pressed again to continue cooking.

NN-A880




# 4. Operation And Digital Programmer Circuit Test Procdure

### 4.1 Setting the Clock

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Plug the power supply cord into the wall outlet | *WELCOME TO PANASONIC REFER TO OPERATING INSTRUCTIONS BEFORE USE* |
| 2. | Press the clock pad | *SET TIME* |
| 3. | Enter the time of day | *1✧25*<br>*_ _ PRESS CLOCK* |
| 4. | Press the clock pad | *1 : 25* |

### 4.2 Microwave Cooking

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Place a water load in the oven | ▬ |
| 2. | Press Micro power once to set high power | *HIGH*<br>*_ _ SET TIME* |
| 3. | Set time at 10 sec. by pressing 10 sec. once | *HIGH*<br>*10*<br>*sec*<br>*_ _ PRESS START* |
| 4. | Press Micro power pad 3 times to set medium power | *MEDIUM*<br>*_ _ SET TIME* |
| 5. | Set pad for 1 minute by pressing 1 min. pad once | *1 00*<br>*min sec*<br>*_ _ PRESS START*<br>*MEDIUM* |
| 6. | Press the start pad | *10*<br>*sec* |
| 7. | When the first stage cooking has elapsed oven automatically switches to second stage | *1 00*<br>*min sec* |
| 8. | When second stage cooking has elapsed oven bleeps 5 times and shuts off | *OPEN DOOR* |

### 4.3 Auto Weight Defrost

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Select the desired program | *1 BREAD*<br>*_ _ SET WEIGHT*<br>*" "* |
| 2. | Press g or lb and oz | *Lb Oz*<br>*1 BREAD*<br>*_ _ SET WEIGHT*<br>*" "* |
| 3. | Enter the weight by pressing the Up & Down pads | *1 Lb 10 Oz*<br>*PRESS START*<br>*" "* |
| 4. | Select the desired program | ***4 54***<br>*min " sec* |

### 4.4 Delay Stand

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Set power level and time | ▬ |
| 2. | Press Stand | *STAND*<br>*SET TIME* |
| 3. | Set standing time | *H1 00*<br>*PRESS START* |
| 4. | Press Start | *10 00*<br>*min sec*<br>*10 00*<br>*min sec* |

### 4.5 Delay Start

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Press Delay | *DELAY START*<br>*SET TIME* |
| 2. | Set delay time | *1H 00*<br>*CHOOSE COOKING MODE* |
| 3. | Set power level and time | ▬ |
| 4. | Press start pad | *1H 00* |

### 4.6 Grill Operation

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Select grill power press once for grill 1 | *GRILL 1*<br>*PRESS START TO PREHEAT OR SET TIME* |
| 2. | Set cooking time | *1 00*<br>*min sec* |
| 3. | Press start | *1 00*<br>*min sec* |

### 4.7 Convection Operation

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Press convection pad to select oven temperature | *150°C*<br>*PRESS START TO PREHEAT OR SET TIME* |
| 2. | Press start to preheat | *P* |
| 3. | Press time pades to enter cooking time | *1H 00*<br>*PRESS START*<br>*150°C* |
| 4. | Press start pad | *1H 00* |

### 4.8 Turbo Bake Operation

| | OPERATION | *SCROLL DISPLAY* |
|---|---|---|
| 1. | Press turbo bake pad to select oven temperature | *150 C*<br>*GRILL 2*<br>*PRESS START* |
| 2. | Press grill pad to select power | *GRILL 3*<br>*PRESS START TO PREHEAT OR SET TIME*<br>*150 C* |
| 3. | Press start to preheat | *P* |
| 4. | Pres time pads to enter cooking time | *H 10*<br>*PRESS START*<br>*150 C*<br>*GRILL 3* |
| 5. | Press start | *10 00*<br>*min sec* |

### 4.9 Combination Cooking (Convection and Microwave)

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Press combination pad | *COMBINATION CHOOSE FIRST COOKING MODE* |
| 2. | Press convection pad to select oven temperature | *150 C*<br>*SELECT MICROPOWER COMBINATION* |
| 3. | Select micro power | *MEDIUM*<br>*SET TIME*<br>*COMBINATION*<br>*150 C* |
| 4. | Press start if preheating | *P 59*<br>*sec* |
| 5. | Set cooking time | *H 10*<br>*PRESS START*<br>*COMBINATION*<br>*150 C*<br>*MEDIUM* |
| 6. | Press start pad | *10 00*<br>*min sec* |

### 4.10 Combination Cooking (Grill and Microwave)

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Press combination pad | *COMBINATION CHOOSE FIRST COOKING MODE* |
| 2. | Press grill pad to select oven temperature | *GRILL 1*<br>*SELECT MICROPOWER COMBINATION* |
| 3. | Select micro power | *MEDIUM*<br>*PRESS START TO REHEAT OR SET TIME COMBINATION*<br>*GRILL 1* |
| 4 | Press start if preheating | *P* |
| 5. | Set cooking time | *H 10*<br>*PRESS START*<br>*COMBINATION*<br>*GRILL 1*<br>*MEDIUM* |
| 6. | Press start pad | *10 00*<br>*min sec* |

### 4.11 Combination Cooking (Turbo Bake and Microwave)

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Press combination pad | *COMBINATION CHOOSE*<br>*FIRST COOKING MODE* |
| 2. | Press Turbo Bake pad to select oven temperature | *150 C*<br>*GRILL 2*<br>*SELECT MICROPOWER*<br>*COMBINATION* |
| 3. | Select micro power | *MEDIUM*<br>*SET TIME*<br>*COMBINATION*<br>*150 C*<br>*GRILL 2* |
| 4. | Press start if preheating | *P* |
| 5. | Set cooking time | *H 10*<br>*PRESS START*<br>*COMBINATION*<br>*150 C*<br>*GRILL 2*<br>*MEDIUM* |
| 6. | Press start pad | *10 00*<br>*min sec* |

### 4.12 Auto Weight Cook Programs NN-A850WB, NN-A850CB

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Select the desired auto weight cook program | *1 REHEAT CHILLED MEAL*<br>*FIRST COOKING MODE*<br>*SET WEIGHT* |
| 2. | Press to select grams or pounds and ounces | *LB OZ*<br>*1 REHEAT CHILLED MEAL* |
| 3. | Enter the weight by pressing the up and down pads | *1 LB 2 OZ*<br>*PRESS START* |
| 4. | Press start | *5 57*<br>*min sec* |

### 4.13 Auto Weight Cook Program NN-A880WB

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Select the desired auto weight cook program | *1 REHEAT CHILLED MEAL*<br>*FIRST COOKING MODE*<br>*SET WEIGHT* |
| 2. | Press to select grams or pounds and ounces | *LB OZ*<br>*1 REHEAT CHILLED MEAL* |
| 3. | Enter the weight by pressing the up and down pads | *1 LB 2 OZ*<br>*PRESS START* |
| 4. | Press start | *5 57*<br>*min sec* |

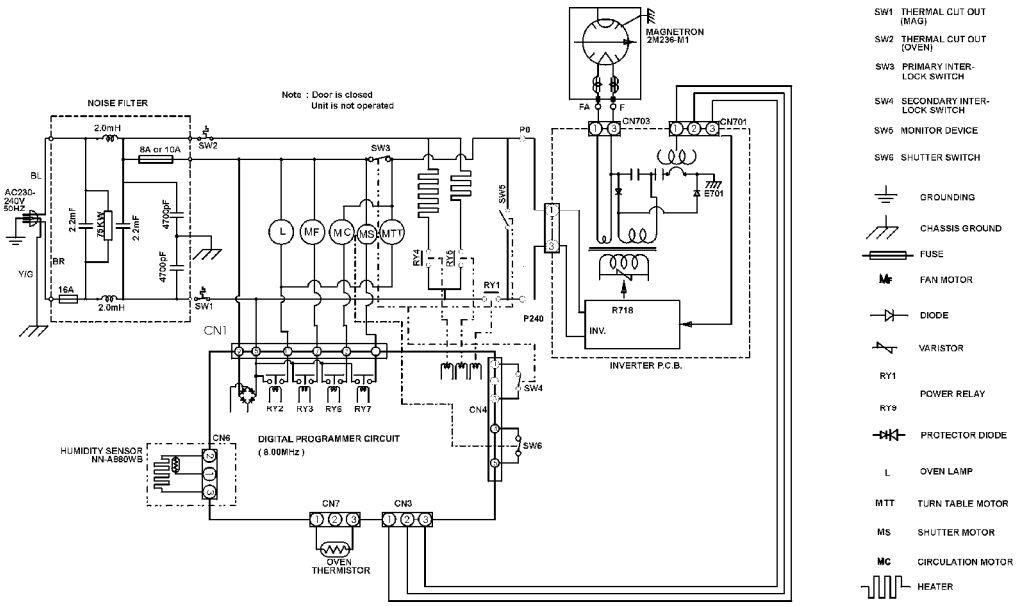
### 4.14 Auto Sensor and Sensor Combi Programs for NN-A880WB

| | OPERATION | SCROLL DISPLAY |
|---|---|---|
| 1. | Select the desired sensor program | 4. FRESH FISH<br>*PRESS START* |
| 2. | Press start | 4. FRESH FISH |

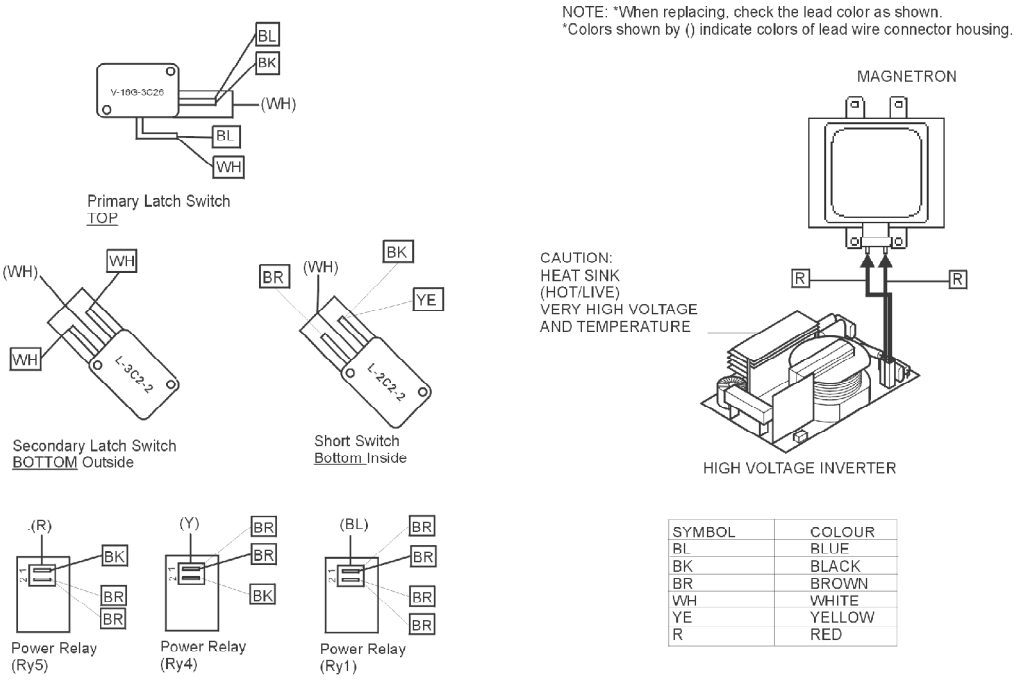
Note: If you select an auto sensor program directly after plugging the oven in an initial warm up period will automatically count down in the display window, after which the sensor program can be operated

Note : The sensor programs cannot be used when the oven is hot. If a second sensor program is selected "HOT" will appear in the displlay.

# 5. Schematic Diagram




# 6. Wiring Diagram




| SYMBOL | COLOUR |
|---|---|
| BL | BLUE |
| BK | BLACK |
| BR | BROWN |
| WH | WHITE |
| YE | YELLOW |
| R | RED |

# 7. Description of Operating instruction

## 7.1. Variable power cooking control

**The HIGH VOLTAGE INVERTER POWER SUPPLY controls the output power by a signal from the digital Programmer circuit DPC. The power relay (RY1) turns on to supply power to the inverter circuit. The level of output power is controlled by the drive signal level from the inverter circuit. NOTE1: The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating the magnetron filament. / NOTE: 2 If microwave cooking is over 8 minutes on HIGH power, the fan motor rotates for 1 minute after cooking to cool the oven and electrical components.**

**Duty cycles for microwave cooking**

| | Output | Duty ON/OFF | |
|---|---|---|---|
| | | ON time | OFF time |
| High | 1000W | 22” | 0” |
| Defrost | 440W | 16” | 6” |
| Medium | 600W | 22” | 0” |
| Low | 440W | 22” | 0” |
| Simmer | 440W | 15” | 7” |
| Warm | 440W | 8” | 14” |

## 7.2. Grill Cooking

**The digital programmer circuit controls the grill power by operating the power relay RY4 in the sequence shown in the table below**

**Duty cycles for Grill Cooking**

| | Duty ON/OFF | |
|---|---|---|
| | ON Time | OFF Time |
| Grill 1 | 66” | 0” |
| Grill 2 | 54” | 12” |
| Grill 3 | 42” | 24” |

## 7.3. Auto weight defrost, Auto weight Cook

**When an auto control feature is selected and the start pad pressed:**

1. **The digital programmer circuit determines the power level and the cooking time and indicates the operating state in the display. The table shows the corresponding cooking times for each category and its respective weight.**
2. **When the cooking time in the display window has elapsed, the oven turns off automatically via the control signal from the digital programmer circuit.**
   **Note: After auto cooking if the oven temperature is over the predetermined temperature the fan motor rotates to cool the oven and its components.**

**Auto Weight Defrost NN-A880WB NN-A850WB NN-A880CB**

| Category | 1st Touch Weight | Cooking Time |
|---|---|---|
| Bread | 100 | 45s |
| Meat Items | 200 | 3m 40s |
| Meat Joints | 400 | 6m 20s |

**Auto weight Cook NN-A880WB**

| Category | 1st Touch Weight | Cooking Time |
|---|---|---|
| 9.Whole Chicken | 1000 | 18m 20s |
| 10.Chicken Portions | 300 | 9m 30s |
| 11.Beef/Lamb | 500 | 14m 40s |
| 12.Casserole | 800 | 56m 40s |
| 13.Chilled Crispy Top | 300 | 10m |
| 14.Frozen Crispy Top | 300 | 14m |
| 15.Bake Pastry | 600 | 15m |
| 16.Bake Cake | 400 | 11m 40s |

**Auto weight Cook NN-A850WB NN-A850CB**

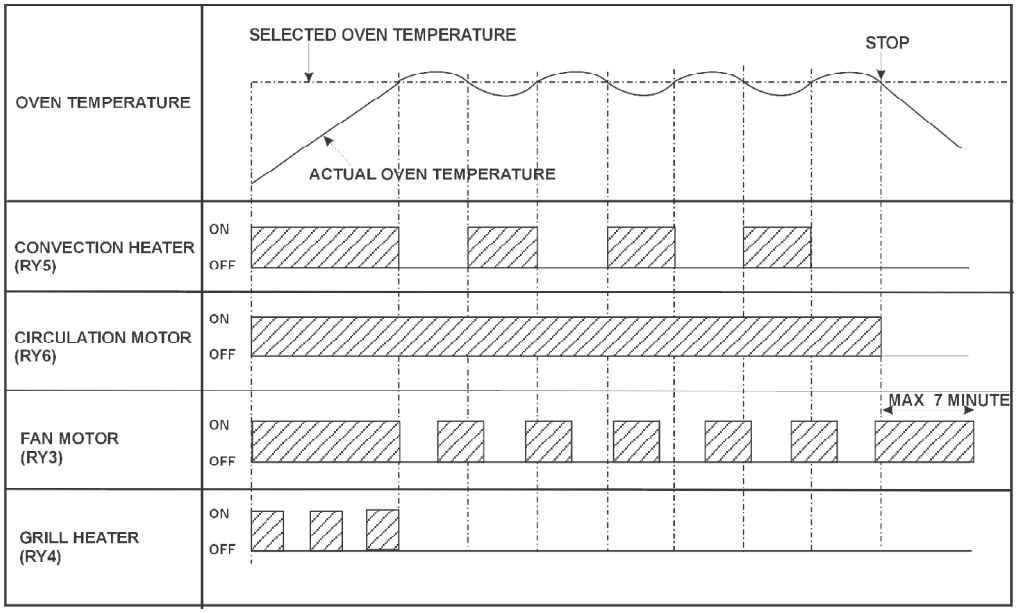
| Category | 1st Touch Weight | Cooking Time |
|---|---|---|
| 1.Chilled Meal | 300 | 3m 30s |
| 2. Frozen Meal | 300 | 6m 20s |
| 3. Fresh Vegatables | 100 | 2m 20s |
| 4. Fish | 100 | 1m |
| 5. Jacket Potatoes | 200 | 16m 30s |
| 6.Frozen Potato Products | 200 | 10m |
| 7. Whole Chicken | 1000 | 18m 20s |
| 8. Chicken Portions | 300 | 9m 30s |
| 9. Beef/Lamb | 500 | 14m 40s |
| 10. Casserole | 800 | 56m 40s |
| 11. Chilled Crispy Top | 300 | 10m |
| 12. Frozen Crispy Top | 300 | 14m |
| 13. Chilled Pizza | 200 | 7m 40s |
| 14. Frozen Pizza | 200 | 10m |
| 15. Bake Pastry | 600 | 15m |
| 16. FruitCrumble | 500 | 18m 20s |

## 7.4. Convection Cooking

1. **The digital programmer circuit operates the power relays RY3,RY5 and RY6 in the sequence as shown in the figure below.**
2. **When the oven reaches a predetermined temperature the digital programmer circuit stops supplying power to relay RY5, resulting in the convection heater turning off.**
3. **When the temperature drops below the predetermined temperature, the digital programmer circuit supplies power to**

**power relay RY5 resulting in the convection heater turning on.**
**Note: After the convection process, if the oven temperature is higher than the predetermined temperature, the fan motor rotates to cool the electronic components and the oven.**

**Figure 1**




**Convection Cooking Duty Cycles**

## 7.5. Combination Cooking

**Combination cooking is achieved by operating the microwave and heater modes together during one cooking cycle. There are three combination modes.**

## 1. Combination (convection and microwave)

## 2. Combination (grill and microwave)

## 3. Combination (grill, convection and microwave)

**The digital programmer circuit operators the power relays as shown in the figures below.**
**When the oven temperature reaches the predetermined temperature, the digital programmer circuit stops supplying power to relay (RY5) resulting in the convection heater turning off. During this time the digital programmer circuit continues to operate relay (RY1) so that microwave activity continues at the duty cycle selected. The inverter control signal level is also maintained. The microwave activity continues to cycle until the entire cooking program is completed.**
**When the oven temperature drops below the selected temperature, the digital programmer circuit operates power relay (RY5) switching on the heater elements.**
**In the case of grill combination the sequence applies with the digital programmer circuit switching power relay (RY4) to control, the grill elements.**
**With convection, grill and micro power combination. The grill elements and convection elements are operated alternatively whilst the oven temperature is above the selected level.**

**Convection And Microwave Combination Duty Cycles**

| Convection Heater | Micropower | | | |
|---|---|---|---|---|
| 100 - 250 C | | OUTPUT | ON | OFF |
| | Medium | 600W | 66 | 0 |
| | Low | 440W | 66 | 0 |
| | Simmer | 440W | 45 | 21 |
| | Warm | 440W | 24 | 42 |

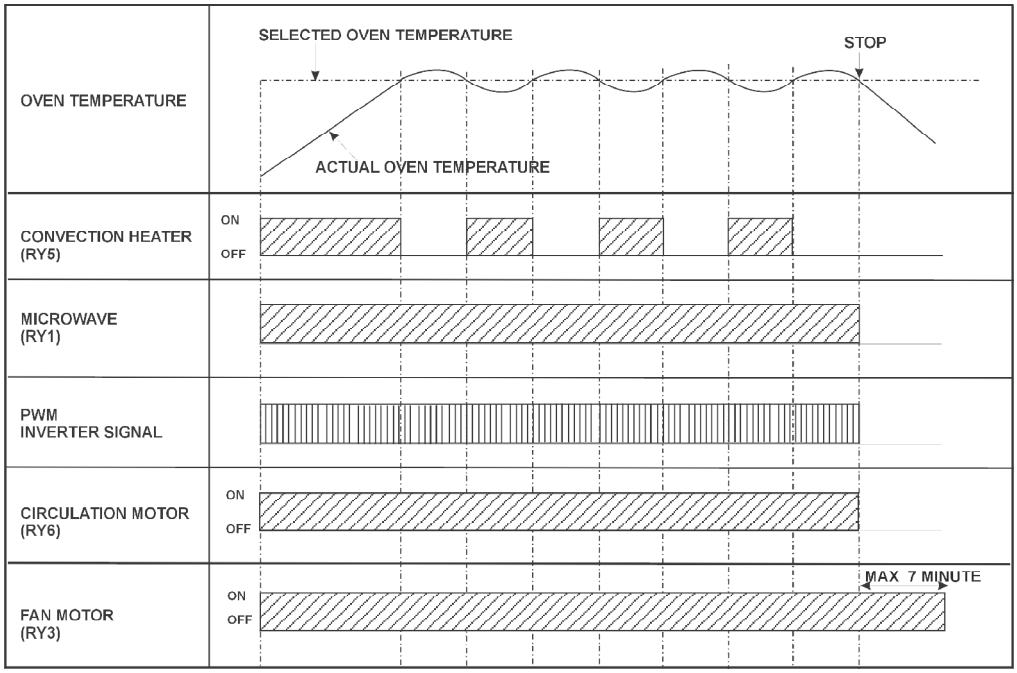
**Grill And Microwave Combination Duty Cycles**

| Grill Heater | | | Micropower | | | |
|---|---|---|---|---|---|---|
| | ON | OFF | | OUTPUT | ON | OFF |
| Grill 1 | 66 | 0 | Medium | 600W | 66 | 0 |
| Grill 2 | 48 | 18 | Low | 440W | 66 | 0 |
| Grill 3 | 36 | 30 | Simmer | 440W | 45 | 21 |
| | | | Warm | 440W | 24 | 42 |

**Grill Convection And Microwave Combination Duty Cycles**

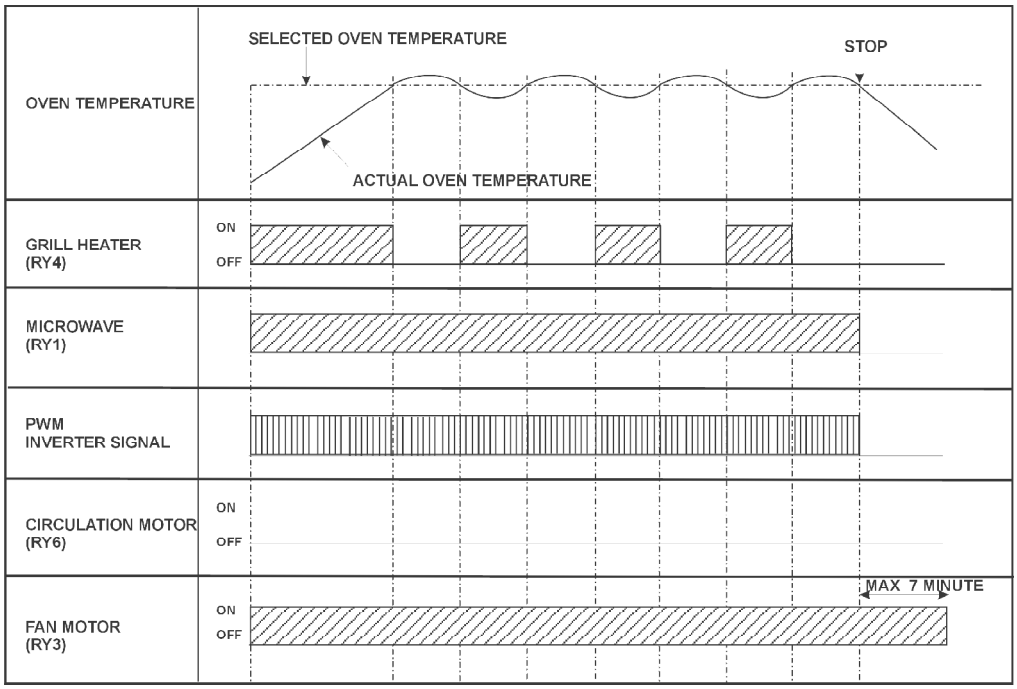
| Convection Heater | Grill Heater | | | Micropower | | | |
|---|---|---|---|---|---|---|---|
| 100 - 250 C | | ON | OFF | | OUTPUT | ON | OFF |
| | Grill 1 | 66 | 0 | Medium | 600W | 66 | 0 |
| | Grill 2 | 48 | 18 | Low | 440W | 66 | 0 |
| | Grill 3 | 36 | 30 | Simmer | 440W | 45 | 21 |
| | | | | Warm | 440W | 24 | 42 |

**Figure 1**

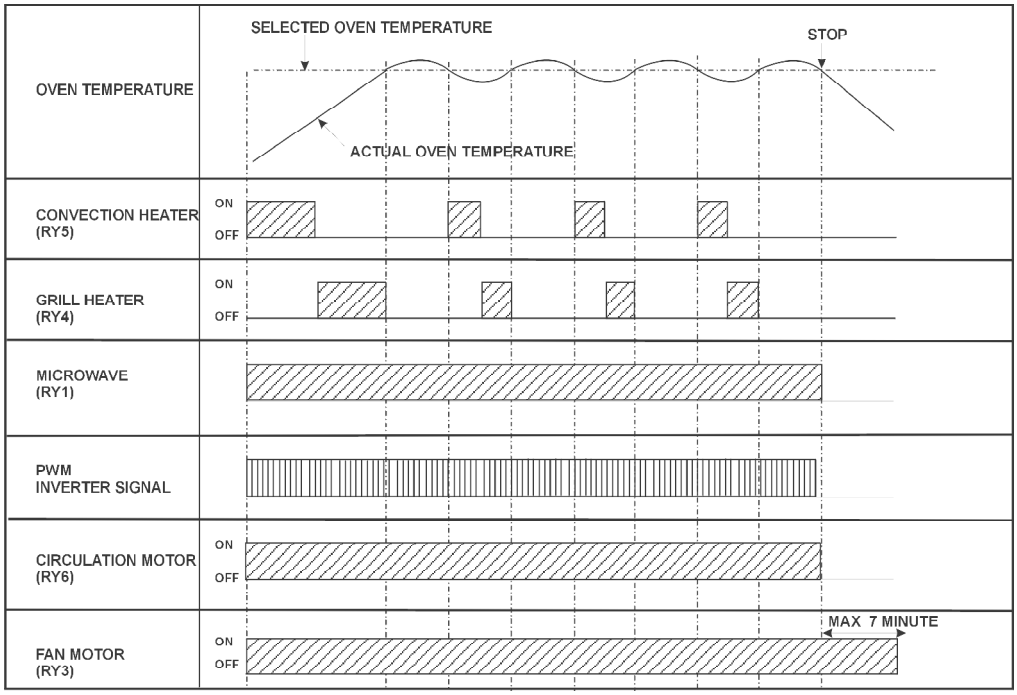



**Convection and microwave duty cycles**

**Figure 2**




**Grill and microwave duty cycles**




**Grill,Convection and microwave duty cycles**

## 7.6. One touch Auto sensor cooking NN-A880WB

**Auto sensor cook is a revolutionary way to cook by microwave without setting a power level or selecting a time. All that is necessary is to select an auto sensor program before starting to cook.**
**/**
**Understanding Auto sensor cooking / / As food cooks, a certain amount of steam is produced. If the food is covered, this steam builds up and eventually escapes from the container. In auto sensor cooking, a carefully designed instrument, called the humidity sensor element, senses the escape of steam. then, based upon the auto sensor program selected, the unit will automatically determine the correct power level and the proper length of time it will take to cook the food.**
**NOTE: Auto sensor cooking is successful with the foods and recipes found in the auto sensor cooking guide. Because of the vast differences in food composition, items not mentioned in the cooking guide should be prepared in the microwave oven using the power select and time features. Please consult variable power microwave cook book for procedures.**
**/ Explanation of the auto sensor cooking process /**

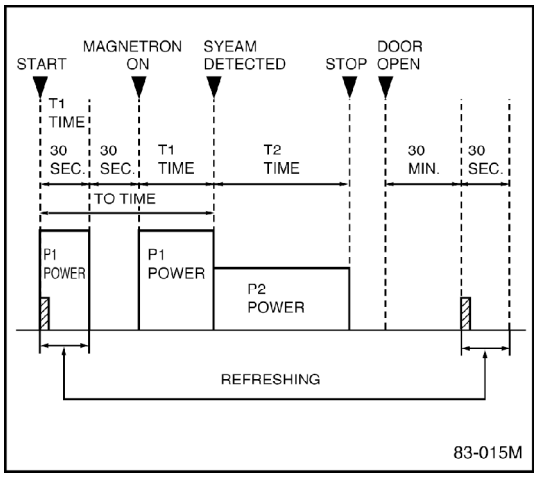
1. **The shaded columns in figure 1 indicate when the humidity sensor heater is on.**
2. **During the 30 second period there is no microwave activity. When calculating the T2 time by using the formula below, make sure this 30 seconds is subtracted from the T0 time.**
3. **T1 time T0 time - 30 seconds**
4. **T2 time when the steam escapes from the cooking container placed in the oven, the humidity sensor detects it and the microprocessor calculates the balance of cooking time. This T2**

**time is then shown in the display and begins counting down.**

**Balance of cooking (T2 time)**
**The balance of cooking time which is called T2 time, can be calculated by the following formula.**
**/ T2 time (in sec.) = T1 time x K factor**
**NOTE: Remember, the T1 time starts after the start pad is tapped. The coefficient K is programmed into the microprocessor memory and they are listed in the following tables along with the P1 and P2 powe r. /**
**NOTE: When "More"or "Less" pad is selected, the K factor varies resulting in T2 time to be increased or decreased.**
**Calculating the T2 time**
**Example 1: If the t1 time is measured to be 2 minutes and 40 seconds, and the auto sensor program is selected is sensor reheat. Fish (Program 4)**
**T2 = T1 x K**
**= 2 min. and 40 sec. X. 0.3**
**=48 sec.**

| Catergory | P1 POWER | P2 POWER | K FACTOR STANDARD |
|---|---|---|---|
| 1. Chilled meal | HIGH | HIGH | 1.6 |
| 2. Frozen meal | MED | HIGH | 0.9 |

**Figure 1**




**Auto sensor cooking**

# 8. Cautions to Be Observed When Troubleshooting

**Unlike many other appliances, the microwave oven is a high voltage, high current is device. Though it is free from danger in ordinary use, extreme care should be taken during repair.**

**Caution**

**Servicemen should remove their watches whenever working close to or replacing the magnetron.**

## 8.1. Check the grounding

**Do not operate on a two wire extension cord. The microwave oven is designed to be used when**

**grounded. It is imperative, therefore, to ensure the appliance is properly grounded before beginning repair work.**

## 8.2. Inverter Warnings

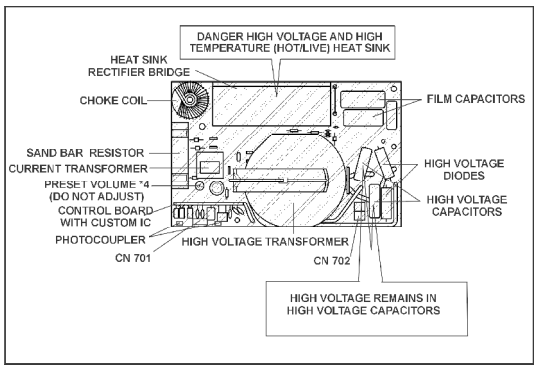
### DANGER, HIGH VOLTAGE AND HIGH TEMPERATURE (HOT/LINE) OF THE INVERTER POWER SUPPLY (U)

**This high voltage inverter power supply handles very high voltage and very high current for the magnetron tube. Though it is free from danger in ordinary use, extreme care should be taken during repair. As you can see, it looks like a TV flyback transformer, however, the current is extremely large and is therefore, dangerous due to this high current and high voltage.**

**The aluminium heat sink is also energized with high voltage (HOT), so do not touch when the AC input terminal is connected. The power devices (Collector) is directly connected to the aluminium heat sink.**

**The aluminium heat sink may be (HOT) due to heat energy, therefore, extreme care should be taken during servicing.**

**Figure 1**

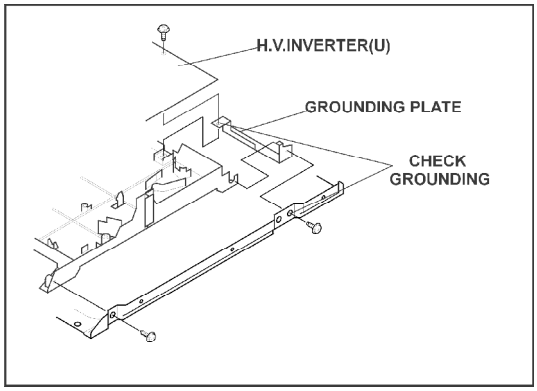



**HV Inverter warning**

### WARNING FOR INVERTER POWER SUPPLY (U) GROUNDING

**Check the high voltage inverter power supply circuit grounding. This high voltage inverter power supply circuit board must have a proper chassis ground, the inverter grounding bracket must be connected to the chassis. If the inverter board is not grounded it will expose very high voltages and cause extreme DANGER! Be sure that the inverter circuit is properly grounded via the inverter earth bracket.**

**Figure 2**



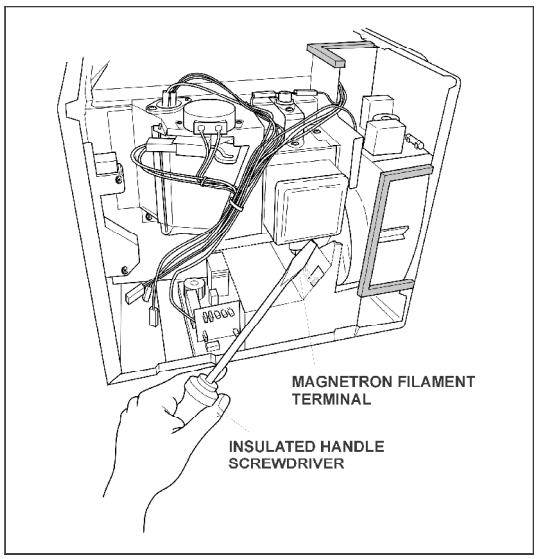

**Inverter Grounding**

**WARNING! DISCHARGE THE HIGH VOLTAGE CAPACITORS**

**For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitors in the inverter power supply circuit board.**

**When replacing or checking parts, remove the power plug from the outlet and short the inverter output terminal of the magnetron filament terminals to the chassis ground with an insulated handle screwdriver to discharge. Please be sure to touch the chassis ground side first and then short to the output terminals.**

**Figure 3**




**Discharging the high voltage capacitors**

**WARNING**

**There is high voltage present with high current capabilities in the circuits of the primary and secondary windings, choke coil and heat sink of the inverter. It is extremely dangerous to work on or near these circuits with the oven energized. DO NOT measure the voltage**

**in the high voltage circuit including the filament voltage of the magnetron.**

**WARNING**

**Never touch any circuit wiring with your hand nor with an insulated tool during operation.**

### 8.3. When parts must be replaced, remove the power plug from the outlet.

### 8.4. When the 10A fuse is blown due to the operation of the short switch:

**WARNING**

**When the 10A 250V fuse is blown due to the operation of the short switch, the primary latch switch and short switch must be replaced. It is also important to change the power relay 1 (RY1) when the continuity test shows shorted contacts.**

1. **This mandatory. Refer to “adjustments and measurements” for the location of these switches.**
2. **When replacing the fuse, confirm that it has the appropriate rating for these models.**
3. **When replacing faulty switches, be sure the mounting tabs are not bent, broken or deficient in their ability to hold the switches.**

### 8.5. Avoid inserting nails, wire etc. through any holes in the unit during operation.

**Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any holes or gaps, because such objects may work as an antenna and cause microwave leakage.**

### 8.6. Confirm after repair

1. **After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing. Microwaves might leak if screws are not properly tightened.**
2. **Make sure that all electrical connections are tight before inserting the plug into the wall outlet.**
3. **Check for microwave energy leakage. (Refer to procedure for measuring microwave energy leakage).**

**CAUTION MICROWAVE RADIATION**

**DO NOT BECOME EXPOSED TO RADIATION FROM THE**

**MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY**

**IMPORTANT NOTICE**

**The following components have potentials above 250V while is appliance is operated.**

**- Magnetron**
**- High voltage transformer (Located on inverter (U))**
**- High voltage diodes (Located on inverter (U))**
**- High voltage capacitors (Located on inverter (U))**

**Pay special attention in these areas.**

**When the appliance is operated with the door hinges or magnetron fixed incorrectly, the microwave leakage can reach more than 5mW/ $cm^3$. After repair or exchange, it is very important to check if the magnetron and the door hinges are correctly fixed.**

### 8.7. Sharp Edges

**Caution**

**Please use caution when unpacking, installing or moving the unit, as some exposed edges may be sharp to touch and cause injury if not handled with care.**

# 9. Parts Replacement Procedure

### 9.1. Magnetron

1. **Discharge the high voltage capacitors on the inverter circuit.**
2. **Remove the five screws shown in figure 1**
3. **Disconnect the two high voltage leads from the magnetron**
4. **Remove the four screws holding the magnetron as shown in figure 2**

**NOTE: After replacing the magnetron, tighten the mounting screws making sure that there is no gap between the waveguide and the magnetron to prevent microwave leakage.**

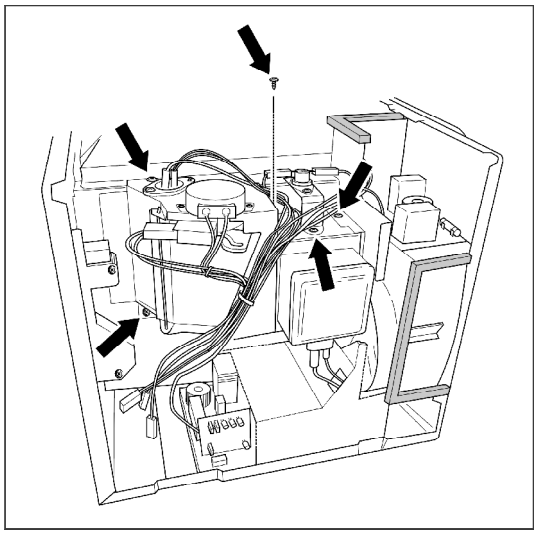
**Caution**

**When replacing the magnetron, ensure that the antenna gasket is in place.**

**Note**

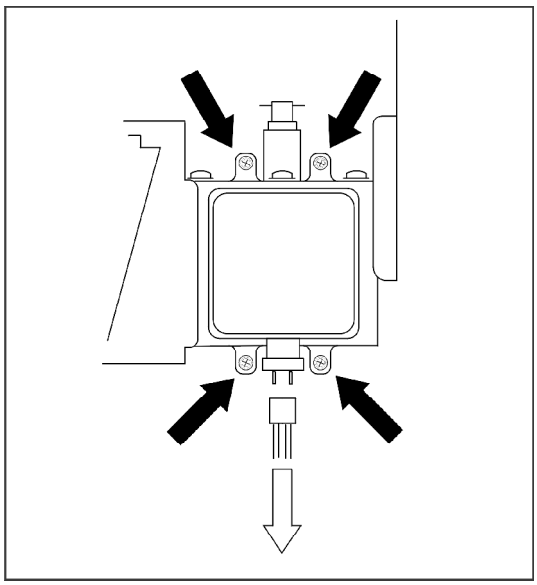
**The magnetron used for this model is unique for the inverter power supply system. Make sure to use the magnetron as listed in the parts list.**

**Figure 1**



**Removal of the magnetron**

**Figure 2**



**Screws to remove the magnetron**

## 9.2. Inverter power supply (U)

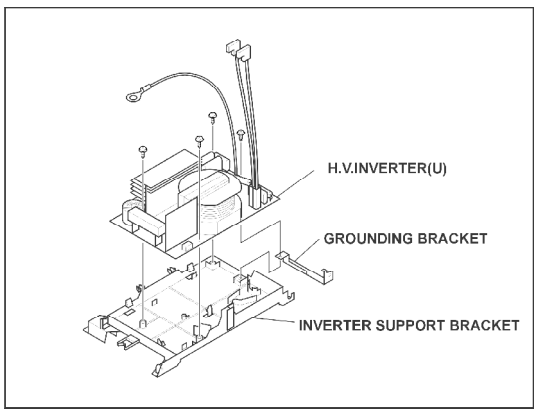
1. **Discharge the high voltage capacitors**
2. **Unplug the H.V. Lead wires from the magnetron**
3. **Remove the connector CN701 and CN702 from the inverter PCB**
4. **Remove the two screws holding the inverter base to the chassis (See figure 3)**
5. **Remove the one screw holding the inverter earth wire to the oven chassis.**

6. Carefully remove the inverter PCB and support base from the oven.
7. Remove the air guide E by un-clipping the catch hooks
8. Remove the four screws holding the PCB to the inverter support base.

**Caution when replacing the inverter power supply (U)**

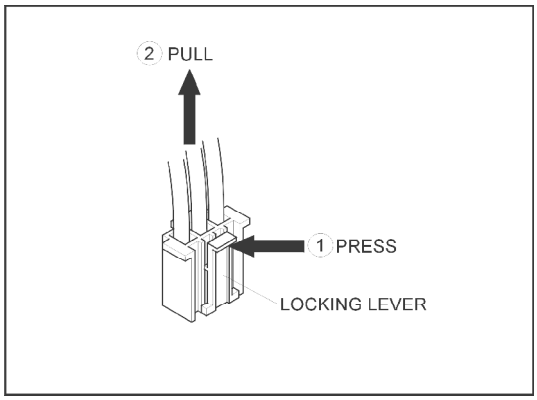
1. Make sure that grounding plate is in place
2. Securely tighten the grounding screw through the side of the chassis (Base).
3. Securely connect the 3 lead wire connectors
4. Make sure that the heat sink has enough space (gap) from the oven. Take care not to touch any lead wire to the aluminium heat sink because it is hot.

**Figure 3**




**Removal of the inverter PCB**

**Figure 4**




**Disconnecting the PCB lock connector**

## 9.3. Digital Programmer Circuit (DPC) and membrane key board.

**NOTE: Ground any static electric built up on your body before handling the DPC.**

1. **Disconnect all connectors from the DPC.**
2. **Remove the four screws holding the escutcheon base and slide the escutcheon base upward slightly. removal is easier with the door open.**
3. **Release the flat cable.**
4. **Remove the six screws holding the DPC DU assembly**
5. **Remove the door lever**
6. **Remove the nine screws holding the DPC AU assembly**

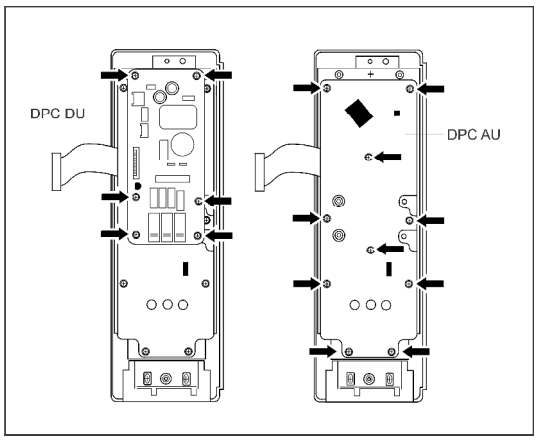
**To remove escutcheon pad**

1. **Remove the escutcheon bracket from the escutcheon base by freeing the 4 catch hooks on the escutcheon base.**
2. **Peel away the display window from the inside of the base.**
3. **Remove the membrane assembly by pushing from the inside of the base and then peeling away from the outside surface.**

**NOTE:**

1. **The escutcheon key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using a hair dryer is recommended for smoother removal**
2. **When installing a new escutcheon key board, make sure that the surface of the escutcheon base is cleared sufficiently so that problems such as, shorted contacts and uneven surfaces can be avoided.**

**Figure 5**




**Removal of DPC DU and DPC AU**

## 9.4. Low voltage transformer and/or power relays

**Note**

**Be sure to ground your body to discharge any static before handling the DPC.**

1. **Using a solder wick or a de soldering tool and a 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.**
2. **With all of the terminal pins cleaned and separated from the DPC contacts, remove the defective transformer/power relays and install the new components making sure that the terminal pins are inserted completely. Carefully re solder all terminal contacts carefully.**

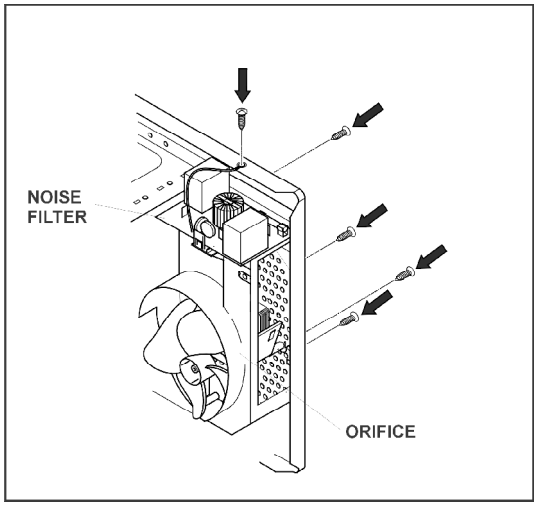
**Note**

**Do not use a soldering iron or de soldering tool of more than 30 watts on DPC contacts**

## 9.5. Fan Motor

1. **Disconnect the two lead wires from the fan motor terminals**
2. **Remove the power cord by removing the two wires from the noise filter and the ground connection from the oven chassis.**
3. **Remove the noise filter**
4. **Remove the two screws holding the orifice assembly**
5. **Remove the two screws holding the fan motor assembly**
6. **Detach the orifice assembly and the fan motor assembly from the oven assembly.**
7. **Remove the fan blade from the fan motor by pulling outward.**

**Figure 6**




**Removing the fan motor**

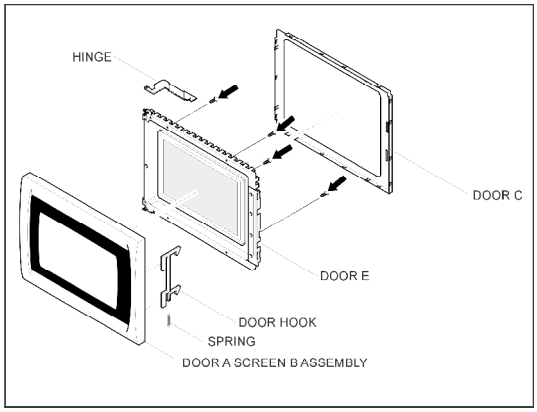
## 9.6. Door disassembly

1. **Remove door C from door E by carefully pulling outward starting from the upper right hand corner using a flat blade screwdriver.**
2. **Remove four screws holding the door E to the door A assembly**
3. **Replace the door A and screen B as a complete unit.**
4. **Remove the door key and spring from the door E**

**After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent excessive microwave leakage.**

1. **When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge in the direction necessary for proper alignment.**
2. **Adjust so that the door has no play between the inner door surface and the oven front surface. if the door assembly is not mounted properly, microwave power may leak from the clearance between the door and oven.**
3. **Perform the microwave leakage test.**

**Figure 7**




**Disassembly of the door**

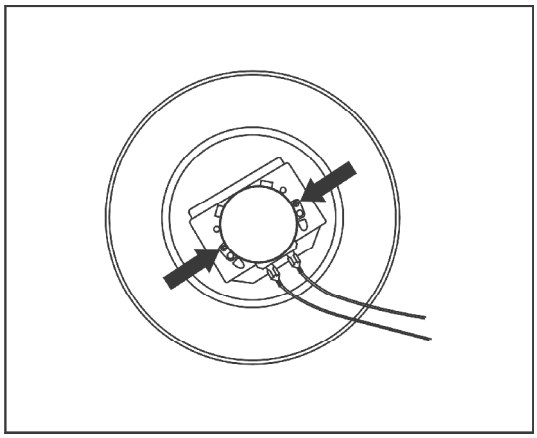
## 9.7. Turntable Motor

1. **Remove the motor cover by breaking off at the 8 spots indicated by the arrows.**
2. **Disconnect the two lead wires connected to the turntable motor**
3. **Remove the turntable motor by removing the two screws**

**Note: After breaking off the motor cover, make sure that cut-off portions are properly trimmed off or bent inside so that no sharp edges are exposed.**

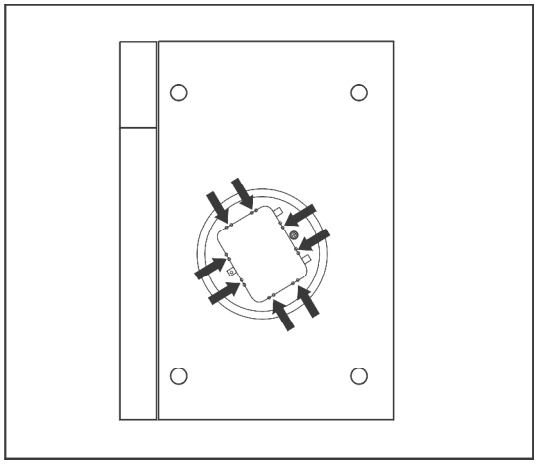
**Note: To secure the motor cover use a 4 x 6 screw.**

**Figure 8**



**Removing the Turntable motor cover**

**Figure 9**

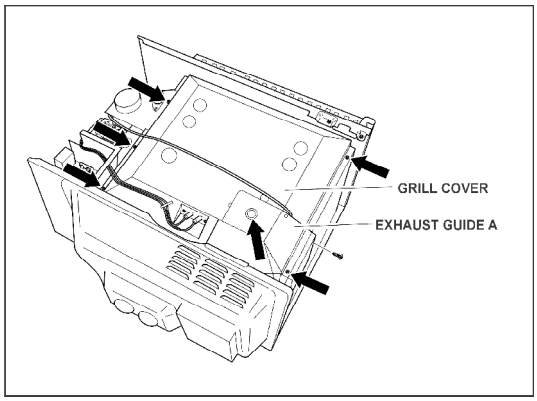


**Two screws to remove the turntable motor**

## 9.8. Quartz Heater

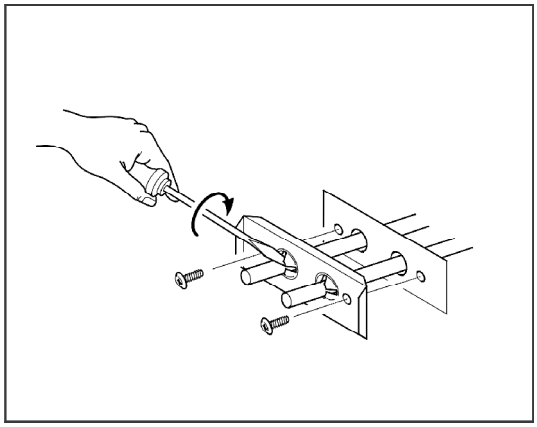
1. **Remove the sensor cable from the DPC connector CN7.**
2. **Remove the exhaust guide A by removing the two screws shown in figure 10.**
3. **Disconnect the cables to the grill heater**
4. **Remove the grill cover by removing the 5 screws in figure 11**
5. **Remove the two screws holding the grill heater (Figure12).**
6. **Loosen the 2 screws holding the ceramic grill holders, turn the holders to release the grill element.**
7. **Remove the heater bracket D by using a flat blade screw driver to lever back the tabs.**
8. **The grill element can now be removed from inside the oven.**

**Figure 10**



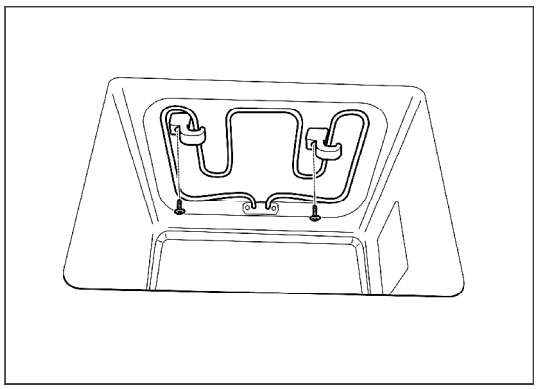

**Removing the exhaust guide and grill cover**

**Figure 11**



**Removing the screws holding the grill heater**

**Figure 12**



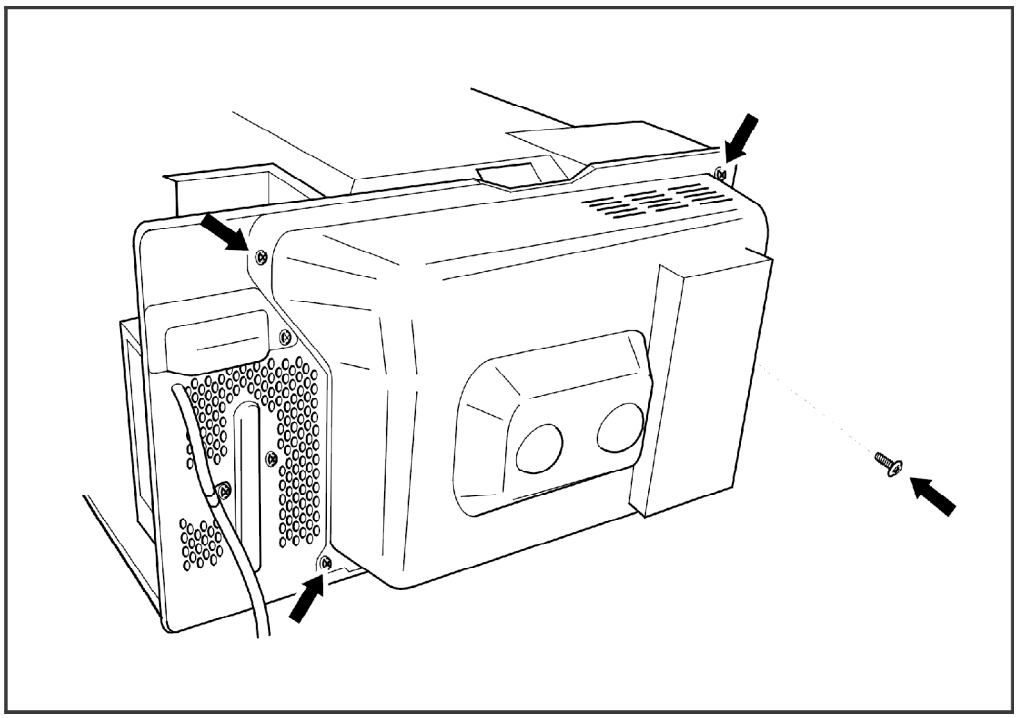
**Removing the grill element**

## 9.9. Convection Element And Circulation Fan Motor

1. **Remove one screw to remove the the exhaust guide D. Figure 13.**
2. **Remove the rear heater cover by removing the three screws. Figure 13**
3. **Remove the temperature sensor by removing the two screws. Figure 14**
4. **Remove the power cord.**
5. **Remove the wire terminals from the circulation fan motor and the convection heater element.**
6. **Remove the four screws from the oven base. Figure 15**
7. **Carefully place hte oven onto its base and remove the backplate.**
8. **Remove the nut holding the circulation fan. Figure 16**
9. **Remove the circulation fan by removing the three screws. Figure 16**

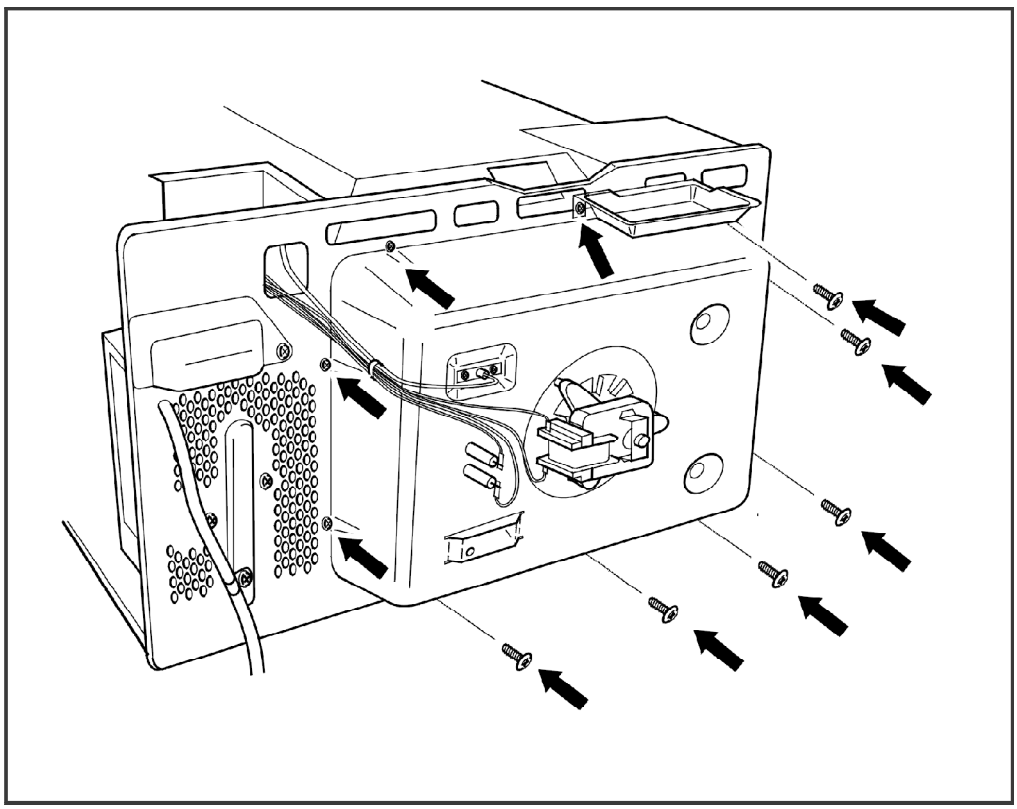
## 10. Remove the convection element by removing the two screws. Figure 16

**Figure 13**



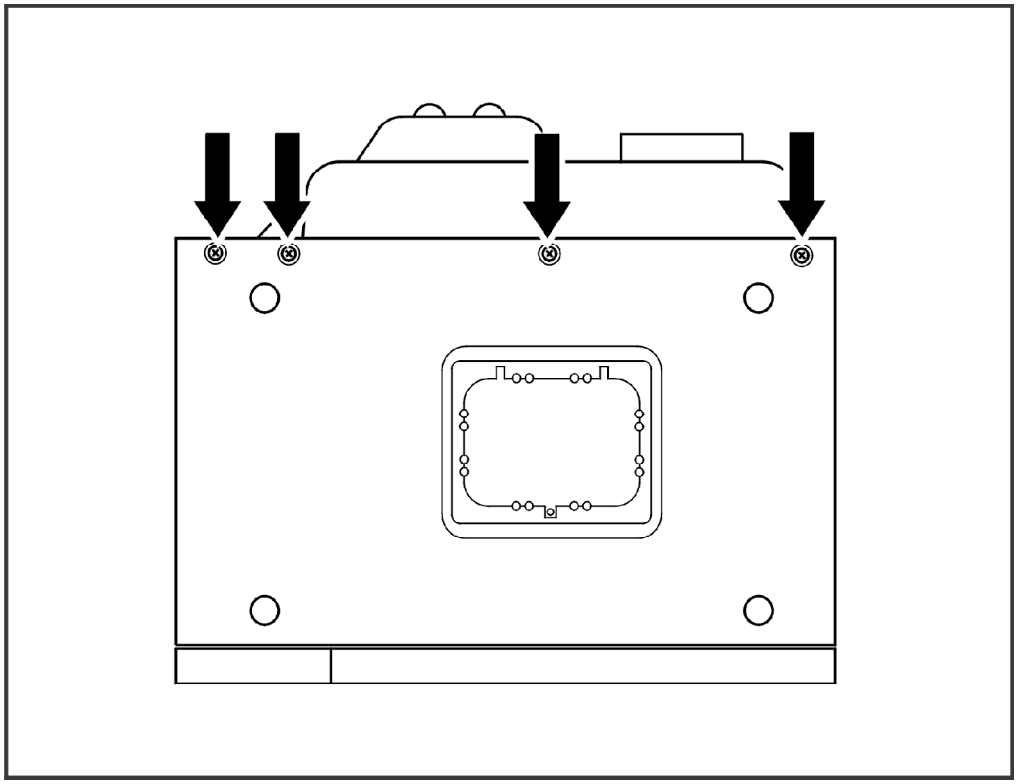
**Removing the rear heater cover**

**Figure 14**



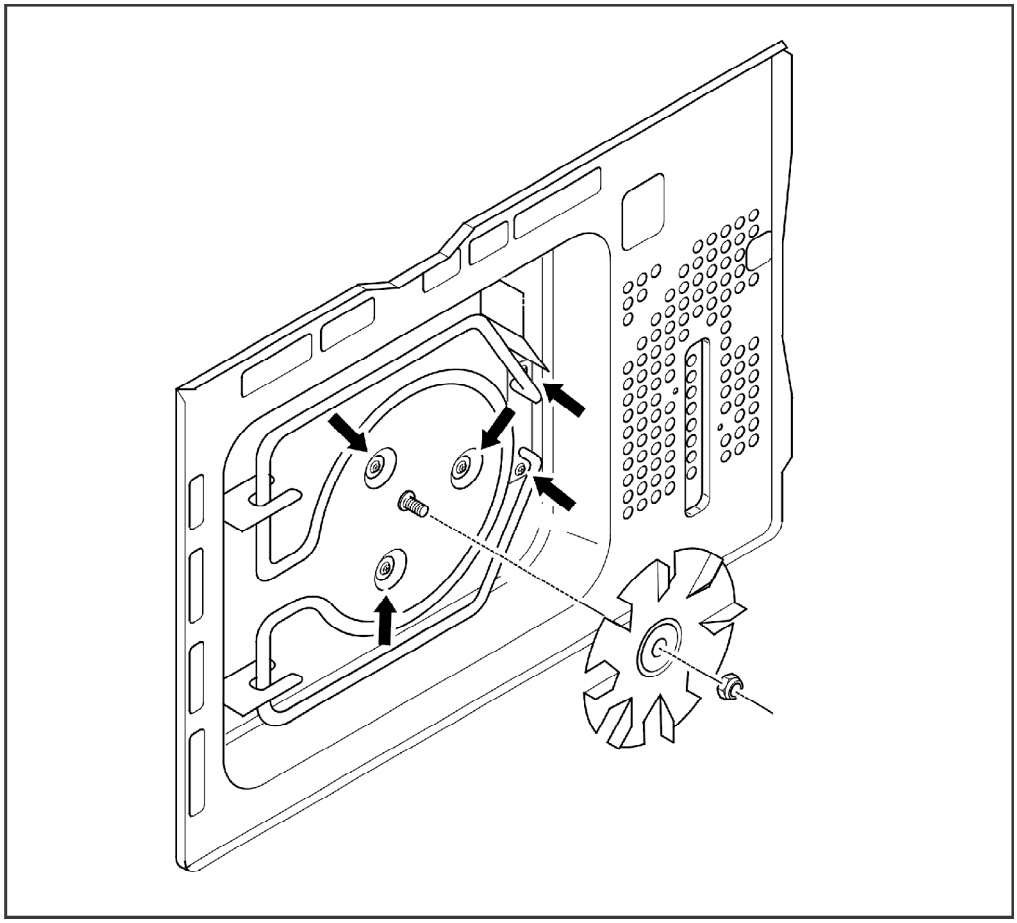
**Removing the oven back plate**

**Figure 15**



**Removing the base plate**

**Figure 16**



Removing the circulation motor

# 10. Component Test Procedure

**Caution**

1. **High voltage is present at the high voltage terminal of the inverter unit, including the aluminium heat sink.**
2. **It is not necessary or advisable to attempt to measure this high voltage.**
3. **Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitors.**

## 10.1. Primary Latch Switch, Secondary Latch Switch and power relay B interlocks.

1. **Unplug the lead connectors to power relay B and verify the continuity of the power relay B 1-2 terminals.**
2. **Unplug the lead connectors to the primary latch switch and**

secondary latch switch.

3. Test the continuity of the switches with the door open and closed with an ohm meter on the lowest scale.
   Normal continuity readings should be as followed.

| | Door Open | Door Closed |
|---|---|---|
| Primary Latch Switch | infinite Ω (Open) | 0 Ω (Close) |
| Secondary Latch switch | infinite Ω (Open) | 0 Ω (Close) |
| Power relay B | infinite Ω (Open) | infinite Ω (Close) |

## 10.2. Short Switch and Monitor Circuit

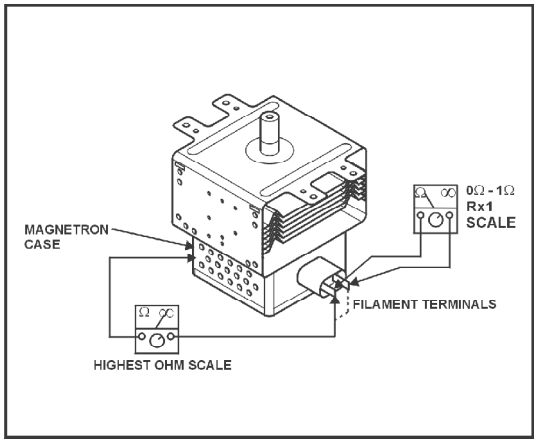
1. Unplug the lead wires from the HV inverter primary terminals.
2. Connect the test probes of the ohm meter to these leads
3. Test the continuity of the short switch with the door open and the door closed using the lowest ohm scale.

| | Door Open | Door Closed |
|---|---|---|
| Monitor switch | 0 Ω | infinte Ω |

## 10.3. Magnetron

**Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose an open filament or shorted magnetron.**

1. Isolate the magnetron from the circuit by disconnecting the HV leads
2. A continuity check across the magnetron filament terminals should indicate one ohm or less
3. A continuity check between each filament terminal and the magnetron case should read open.




## 10.4. Push Button Keyboard

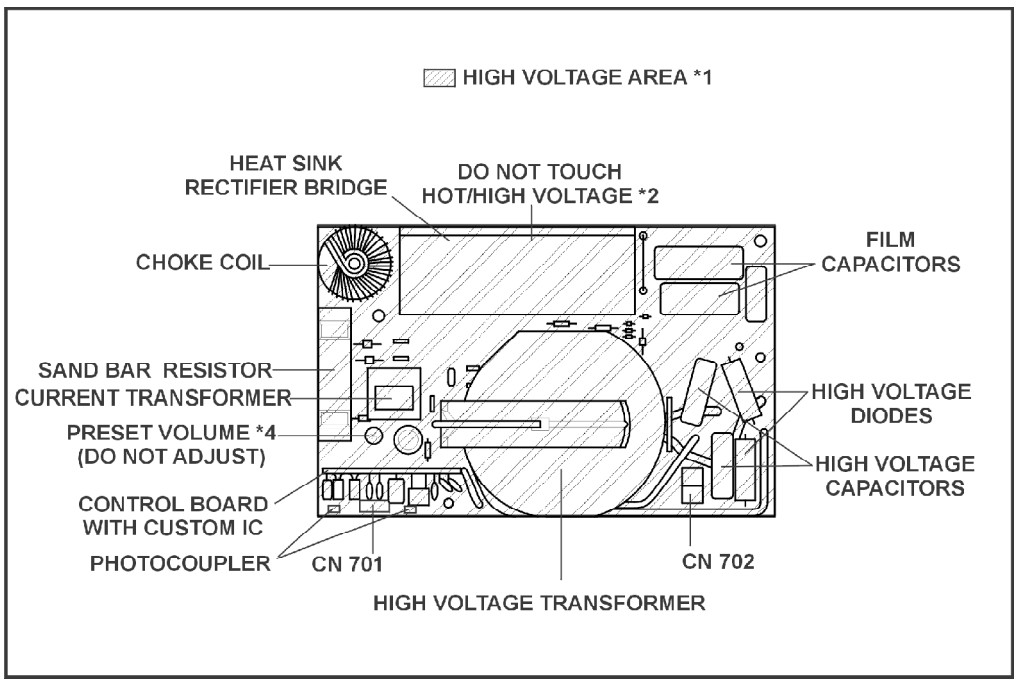
**Check the continuity between the switch terminals, by tapping an appropriate pad on the keyboard. The keypad matrix is shown on .**

## 10.5. Inverter Power Supply

**Caution**

**DO NOT try to repair this inverter power supply). Replace as a whole H.V. Inverter Unit.**

**Figure 3**




**Inveter power supply diagram**

## 10.6. Inverter Power Supply Unit

**Warning**

**Do not attempt to make any measurements in the high voltage circuitry of the inverter or magnetron.**

**See troubleshooting of the inverter circuit and magnetron on page 27 to determine if the inverter power supply is still functioning.**

## 10.7. Temperature Sensor

**A temperature sensor is mounted on the rear of the oven. The resistance reading across the thermistor should read 300K ohm within a temperature range of 10 to 30 degrees centigrade. This would be the temperature range within a kitchen environment. If the resistance measured is outside this range the thermistor is defective and should be replaced.**
**NOTE: When measuring the resistance of the thermistor disconnect the connector from the digital programmer circuit.**
**NOTE: If the microwave oven has been operated allow to cool to room temperature before attempting to measure the thermistor resistance.**

## 10.8. Humidity sensor and digital programmer circuit NN-A880WB

1. **Check the resistance across the sensor heater terminals. Normal cold resistance should read approximately 4.5 ohms.**
2. **Check the volatge across the sensor heater terminals. It should read approximately 2.5VDC**
3. **In order to determine if the auto cooking by humidity sensor is working, perform the following test. /**

1. **Place a water load (150cc) in the oven.**
2. **Press the auto reheat panel.**
3. **Press the start pad**
4. **The humidty sensor detects steam about 2 to 4 minutes after the start pad has been pressed.**
5. **The auto cooking (T1) automatically switches to cooking time. (T2)**
6. **The remaining cooking time T2 appears in the display window. If 48s -1min 36 secs appears in the display , the humidty sensor function is normal.**

# 11. Measurements and Adjustments

**Warning**

- **For continued protection against radiation hazard, replace only with identical parts.**
- **When the 10 amp fuse is blown due to the operation of the short switch, you must replace the primary latch switch and short switch. Then follow the installation procedures below.**
- **Interlock switch replacement - In replacing faulty switches, be sure**

mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

- Refer to the schematic and wiring diagram to ensure proper connection

## 11.1. Installation of primary latch switch, secondary latch switch and short switch.

1. When mounting the primary latch switch, secondary latch switch and short switch to the door hook assembly. Follow the instructions in figure 1.
   NOTE: No specific adjustment during the insulation of each switch into the door hook is necessary.
2. When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of the arrow in figure 1. Ensuring the door does not have any play in it. Check for play by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.
3. Reconnect the short switch, primary switch and secondary latch switches and check the continuity of the monitor circuit and latch switches by following the component test procedures on page.

## 11.2. Measurement of microwave output

**The output power of the magnetron can be determined by performing the IEC standard test. However, due to the complexity of the IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.**

**Necessary equipment:**

- 1 liter beaker
- Glass thermometer
- Wrist watch or stop watch

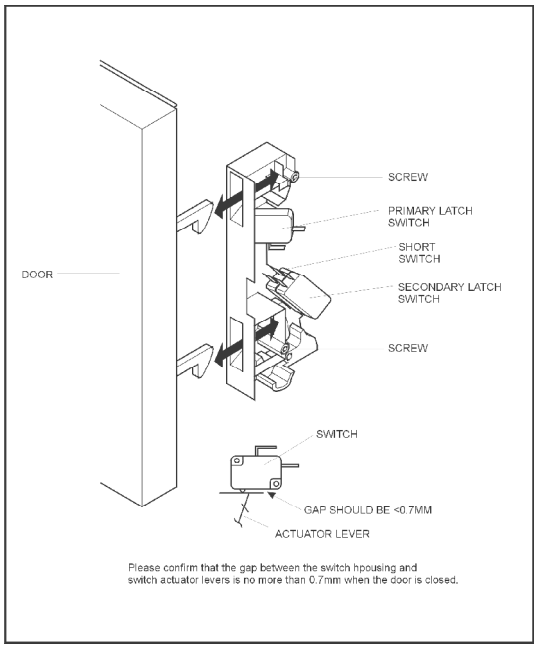
**NOTE: Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.**

1. Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the beakers temperature (Recorded as T1)
2. Place the beaker on the center of the glass cook plate.
3. Stir the water again and read the temperature of the beaker

**(Recorded as T2)**

**4. The normal temperature rise at the high power position for each model is shown in the table. (Figure 2)**

**Figure 1**


DOOR
SCREW
PRIMARY LATCH SWITCH
SHORT SWITCH
SECONDARY LATCH SWITCH
SCREW
SWITCH
GAP SHOULD BE <0.7MM
ACTUATOR LEVER
Please confirm that the gap between the switch hpousing and switch actuator levers is no more than 0.7mm when the door is closed.

**Adjustment of latch switch assembly**

| RATED OUTPUT | TEMPERATURE RISE |
|---|---|
| 1000W | 8°C |

# 12. Troubleshooting Guide

CAUTION

1. Do not try to repair this H.V. Inverter power supply. Replace as whole unit. When returning the inverter unit, pack in the original inverter box.
2. Do not adjust the preser volume on the H.V. Inverter. It is very dangerous to repair or adjust without sufficient test equipment, this circuit handles very high voltage and current.
3. Ensure a good ground connection before begining any troubleshooting.
4. Be careful of the high voltage circuit and take necessary precautions when troubleshooting.
5. Discharge the high voltage capacitors on the inverter.
6. When checking the continuity of the switches on the H.V. Inverter, disconnect one lead wire from these parts and then check the continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter. When disconnecting a plastic connector from a terminal, you must hold the plastic connector and not the lead wire, otherwise the lead wire may become open circuit.
7. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel.
   Whilst working on this board ensure that your body is connected to ground to discharge any static charge.
8. 240 VAC is present on the digital programmer circuit (Terminals of the power relays and the primary circuit of the low voltage transformer). When troubleshooting, be cautious of possible electrical shock.

Before troubleshooting, operate the microwave oven following the correct operating procedures in the instruction manual in order to find the exact cause of any trouble, since operator error may be mistaken for the oven's malfunction.

| | SYMPTOMS | CAUSE | CORRECTIONS |
|---|---|---|---|
| 1. | Oven is dead.<br>Fuse is OK.<br>No display and no operation at all. | 1. Open or loose lead wire harness.<br>2. Open thermal cutout SW1.<br>3. Open low voltage transformer.<br>4. Defective DPC AU or DPC DU. | |
| 2. | Oven does not accept key input (Program). | 1. Key input is not in sequence.<br>2. Open or loose connection of membrane keypad to DPC flat cable.<br>3. Shorted push button on DPC AU.<br>4. Defective DPC AU. | Refer to operation procedure.<br><br><br>Refer to DPC troubleshooting. |
| 3. | Oven lamp and turntable motor turn on when oven is plugged in with door closed. | 1. Misadjustment or loose wiring of secondary latch switch.<br>2. Defective secondary latch switch. | Adjust door and latch switches. |
| 4. | Timer starts countdown but no microwave oscillation.<br>(No heat while oven lamp and fan motor turn on) | 1. Off-alignment of latch switches.<br>2. Open or loose connection of high voltage circuit especially magnetron filament circuit.<br>NOTE: Large contact resistance will bring lower magnetron filament voltage and cause magnetron to have lower output and/or be intermittent.<br>3. Defective high voltage component<br>H.V. Inverter [NEW H.V.] Magnetron<br>4. Open or loose wiring of power relay (RY1).<br>5. Defective primary latch switch.<br>6. Defective power relay RY1or DPC AU or DU. | Adjust door and latch switches.<br><br><br><br><br>Check high voltage component according to component test procedure and replace if it is defective.<br><br>Refer to DPC troubleshooting. |
| 5. | No operation of grill or convection elements. | 1. Open thermal cut-out SW2.<br>2. Defective convection or grill element.<br>3. Defective power relay (RY5) (RY4).<br>4. Defective DPC. | |

## Fuses are not blown

| | SYMPTOMS | CAUSE | CORRECTIONS |
|---|---|---|---|
| 1. | No display and no operation at all.<br>10A Fuse is blown. | 1. Shorted lead wire harness.<br>2. Defective primary latch switch (NOTE 1).<br>3. Defective short switch (NOTE 1).<br>4. Defective Inverter power supply<br>(U) [NEW H.V.]<br>Refer to component test procedure | Check adjustment of primary, secondary latch switch and short switch including door. |
| | | NOTE 1: All of these switches must be replaced at the same time.<br>(Refer to adjustment instructions).<br>Check continuity of power relay B's contacts (between 1 and 2) and if it has continuity, replace power relay B also. | |
| 2. | 16A fuse is blown. | 1. Shorted lead wire harness.<br>2. Short convection element.<br>3. Shorted grill element. | Refer to operation procedure. |

## Fuses are not blown

| | SYMPTOMS | CAUSE | CORRECTIONS |
|---|---|---|---|
| 1. | Microwave output is low.<br>Oven takes longer time to cook food. | 1. Decrease in power source voltage.<br>2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation)<br>3. Aging change of magnetron | Consult electrician.<br>Refer to output test procedures by water temperature raising test. |
| 2. | Turntable on when door is opened. | 1. Shorted primary latch switch. | |
| 3. | Loud buzzing noise can be heard. | 1. Loose fan and fan motor. | |
| 4. | Turntable motor does not rotate. | 1. Open or loose wiring of turntable motor.<br>2. Defective turntable motor. | |
| 5. | No operation of grill or convection elements. | 1. Open or loose wiring of primary and secondary latch switch.<br>2. Operation of thermal cut-out. | Adjust door and latch switches. |
| 6. | Oven returns plug in mode 1 minute after start pad is pressed. | 1. Open thermistor circuit.<br>2. Defective thermistor. | |
| 7. | Oven stops after 30 seconds has elapsed in the auto sensor cooking mode. | 1. Open or loose wiring of sensor from DPC.<br>2. Open humidity sensor.<br>3. Defective DPC. | |
| 8. | Oven returns to plug in mode 18 seconds after start pad is pressed. | 1. Open or loose wiring of shutter motor and shutter switch.<br>2. Open shutter switch.<br>3. Defective shutter motor.<br>4. Defective DPC. | |
| 9. | Oven returns to plug in mode 6 seconds after start pad is pressed. | 1. Shorted shutter switch.<br>2. Defective DPC. | |

## Other problems

### Troubleshooting of Inverter Circuit (U) and Magnetron NEW H.V.

**Oven shuts down after approximately 15 or 33 seconds.**

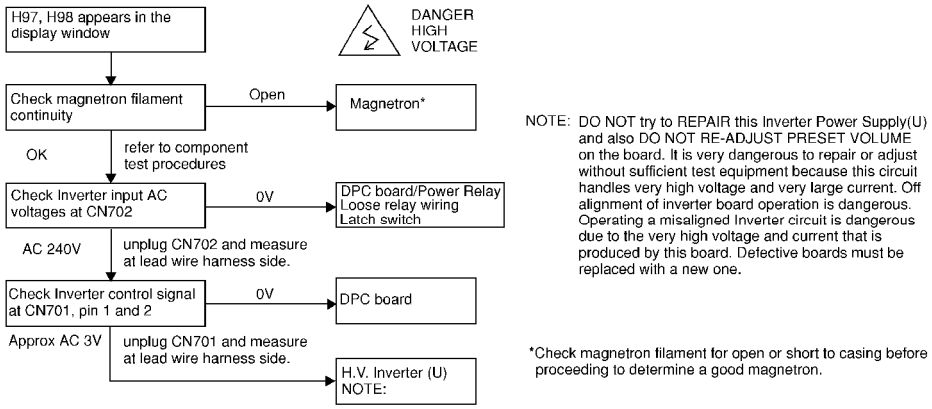
If the microwave oven shuts down after a short time in micropower mode, conduct the following test.

The microwave oven must be set in test mode to activate the self diagnostic failure code system.

SELF TEST MODE

When oven is set in test mode place water load in oven, set micropower to high and time to 1 minute, press start.

H97, H98 appears in display window a short time after start key is pressed and there is no microwave oscillation.


H97, H98 appears in the display window
DANGER HIGH VOLTAGE
Check magnetron filament continuity
Open
Magnetron*
OK
refer to component test procedures
Check Inverter input AC voltages at CN702
0V
DPC board/Power Relay Loose relay wiring Latch switch
AC 240V
unplug CN702 and measure at lead wire harness side.
Check Inverter control signal at CN701, pin 1 and 2
0V
DPC board
Approx AC 3V
unplug CN701 and measure at lead wire harness side.
H.V. Inverter (U) NOTE:

NOTE: DO NOT try to REPAIR this Inverter Power Supply(U) and also DO NOT RE-ADJUST PRESET VOLUME on the board. It is very dangerous to repair or adjust without sufficient test equipment because this circuit handles very high voltage and very large current. Off alignment of inverter board operation is dangerous. Operating a misaligned Inverter circuit is dangerous due to the very high voltage and current that is produced by this board. Defective boards must be replaced with a new one.

*Check magnetron filament for open or short to casing before proceeding to determine a good magnetron.

## Inverter circuit troubleshooting

**Alternative way to troubleshooting oven with AC Ampare meter used.** **NEW H.V.**

**Oven shuts down after approximately 15 or 33 seconds.**

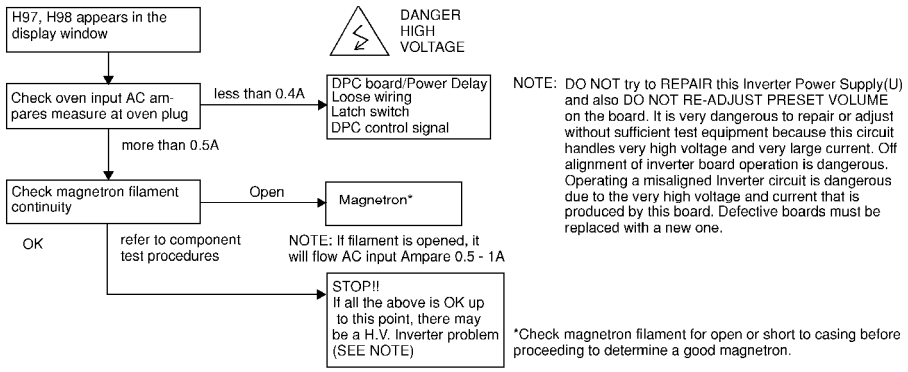
If the microwave oven shuts down after a short time in micropower mode, conduct the following test.

The microwave oven must be set in test mode to activate the self diagnostic failure code system.

SELF TEST MODE

When oven is set in test mode place water load in oven, set micropower to high and time to 1 minute, press start.

H97, H98 appears in display window a short time after start key is pressed and no microwave oscillation with AC Ampare meter used for troubleshooting.


H97, H98 appears in the display window
DANGER HIGH VOLTAGE
Check oven input AC amperes measure at oven plug
less than 0.4A
DPC board/Power Delay
Loose wiring
Latch switch
DPC control signal
more than 0.5A
Check magnetron filament continuity
Open
Magnetron*
OK
refer to component test procedures
NOTE: If filament is opened, it will flow AC input Ampare 0.5 - 1A
STOP!!
If all the above is OK up to this point, there may be a H.V. Inverter problem (SEE NOTE)
NOTE: DO NOT try to REPAIR this Inverter Power Supply(U) and also DO NOT RE-ADJUST PRESET VOLUME on the board. It is very dangerous to repair or adjust without sufficient test equipment because this circuit handles very high voltage and very large current. Off alignment of inverter board operation is dangerous. Operating a misaligned Inverter circuit is dangerous due to the very high voltage and current that is produced by this board. Defective boards must be replaced with a new one.
*Check magnetron filament for open or short to casing before proceeding to determine a good magnetron.

**Alternative method for toubleshooting the inverter circuit**

# 13. Digital Programmer Troubleshooting Guide

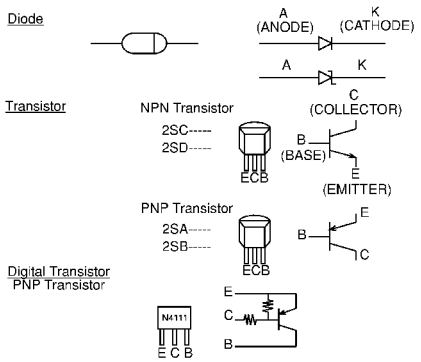
**Trouble Related to Digital Programmer Circuit**

| SYMPTOM | STEP | CHECK | RESULT | CAUSE/CORRECTIONS |
|---|---|---|---|---|
| No display when oven is first plugged in.<br><br>Oven is dead. | 1 | Fuse pattern of DPC | Normal | STEP 2 |
| | | | Open (NOTE) | Shorted Circuit of ZNR, L.V.T., Oven Lamp etc. Replace DPC |
| | 2 | IC10 Pin 9 (12V line) | Abnormal 0V | IC10 |
| | | | Normal 12V | → Step 3 |
| | 3 | IC-1 Pin 73 voltage (Emitter of Q10) | Abnormal | ZD10, Q10, Ribbon Cable |
| | | | Normal = 5V | → Step 4 |
| | 4 | IC-1 pin 27 voltage (15 pin of IC220) | Abnormal | IC-220 |
| | | | Normal | → IC-1, CX1 |

NOTE
Procedure of fuse pattern repairing is as follows:
1. When the fuse pattern (PF2) opens.
(1) Remove the jumper wire (PF3).
(2) Insert the removed jumper wire (PF3) to "(PF2)" position and solder it. If both "PF2" and "PF3" fuse patterns are open, please replace DPC.
NOTE: * At the time of these repairs, make visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short circuit (check primary coil resistance).
If any abnormal condition is detected, replace the defective parts.

| SYMPTOM | STEP | CHECK | RESULT | CAUSE/CORRECTIONS |
|---|---|---|---|---|
| No key input | 1 | Push button switch | Abnormal | Push button switch |
| | | | Normal | IC-1 |
| No beep sound | 1 | IC-1 pin 12, voltage | Abnormal | IC-1 |
| | | | Normal | IC220, BZ310 |
| Power relay A(RY-2) does not turn on even though the program has been set and the start pad is tapped. | 1 | IC-1 pin 23 voltage while operation | Abnormal | IC-1 |
| | | | Normal = 5V | → Step 2 |
| | 2 | Short circuit between pin 6 and pin 16 of IC-2 | Still not turn on | RY-2 |
| | | | RY-2 turns on | IC-220 |
| No microwave oscillation at any power setting. | 1 | IC-1 pin 18 and 16 voltages while operation at high power | Abnormal | IC-1 |
| | | | Normal<br>18---5V, 16---5V | → Step 2 |
| | 2 | Q221 transistor | Abnormal | Q221 |
| | | | Normal | IC220, Q226, RY1 |
| No grill operation at any power setting | 1 | IC-1 pin 18 and 17 voltages while operation at high power | Abnormal | IC-1 |
| | | | Normal<br>18---5V, 17---5V | → Step 2 |
| | 2 | Q222 transistor | Abnormal | Q222 |
| | | | Normal | IC220, Q226, RY4 |
| No convection operation at any power setting | 1 | IC-1 pin 18 and 15 voltages while operation at high power | Abnormal | IC-1 |
| | | | Normal<br>18---5V, 15---5V | → Step 2 |
| | 2 | Q223 transistor | Abnormal | Q223 |
| | | | Normal | IC220, Q226, RY5 |
| Dark or unclear display | 1 | Replace display and check operation | Normal | DISPLAY |
| | | | Abnormal | IC-1 |
| Missing or lighting of unnecessary segment | 1 | Replace IC-1 and check operation | Normal | IC-1 |
| | | | Abnormal | DISPLAY |
| Oven shuts down on Micropower after a short time (set in test mode) (set high power 1 Min) H97/H98 appears in window and oven stops operation. Program High power for 1 minute and conduct following test quickly, unless H97/H98 appears and oven stops.<br>NEW H.V. | 1 | Unplug CN702(2 pin) connector and measure voltage between terminals | 0V | 1. Latch switch<br>2. DPC/Power relay |
| | | | AC line voltage of 240V | → Step 2 |
| | 2 | Unplug CN701(3 pin) connector and measure pin 1 voltage | 0V | 1. DPC |
| | | | Approx. AV 3V | 1. Magnetron<br>2. Inverter |

**How to Check the Semiconductors Using an OHM Meter**




| | FORWARD | REVERSE |
|---|---|---|
| A-K | SMALL | ∞ |

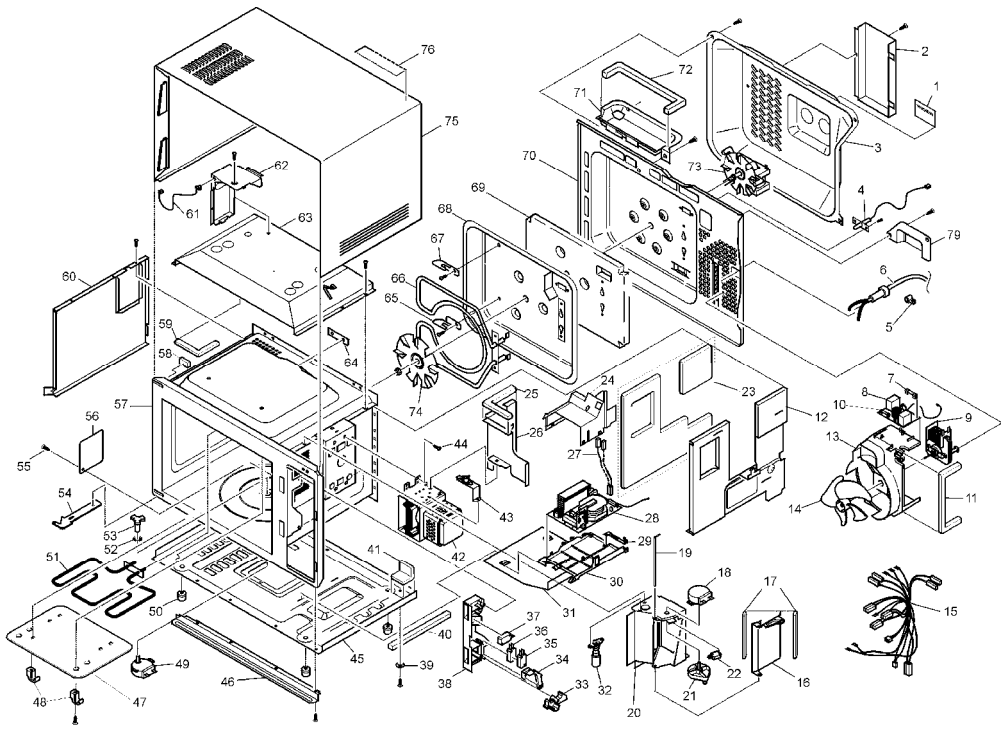
| | FORWARD | REVERSE |
|---|---|---|
| B-E | SMALL | ∞ |
| B-C | SMALL | ∞ |
| C-E | ∞ | ∞ |

| | FORWARD | REVERSE |
|---|---|---|
| E-B | SMALL | ∞ |
| C-B | SMALL | ∞ |
| C-E | ∞ | ∞ |

| | FORWARD | REVERSE |
|---|---|---|
| E-B | 10kΩ~30kΩ | 10kΩ~30kΩ |
| C-B | 50kΩ~90kΩ | ∞ |
| C-E | 40kΩ~80kΩ | ∞ |

**How to check semiconductors**

# 14. Exploded View




# 15. Main Parts List

**1. Part numbers are indicated on most mechanical parts. Please use these part numbers for part orders. Do not use the description of the part.**

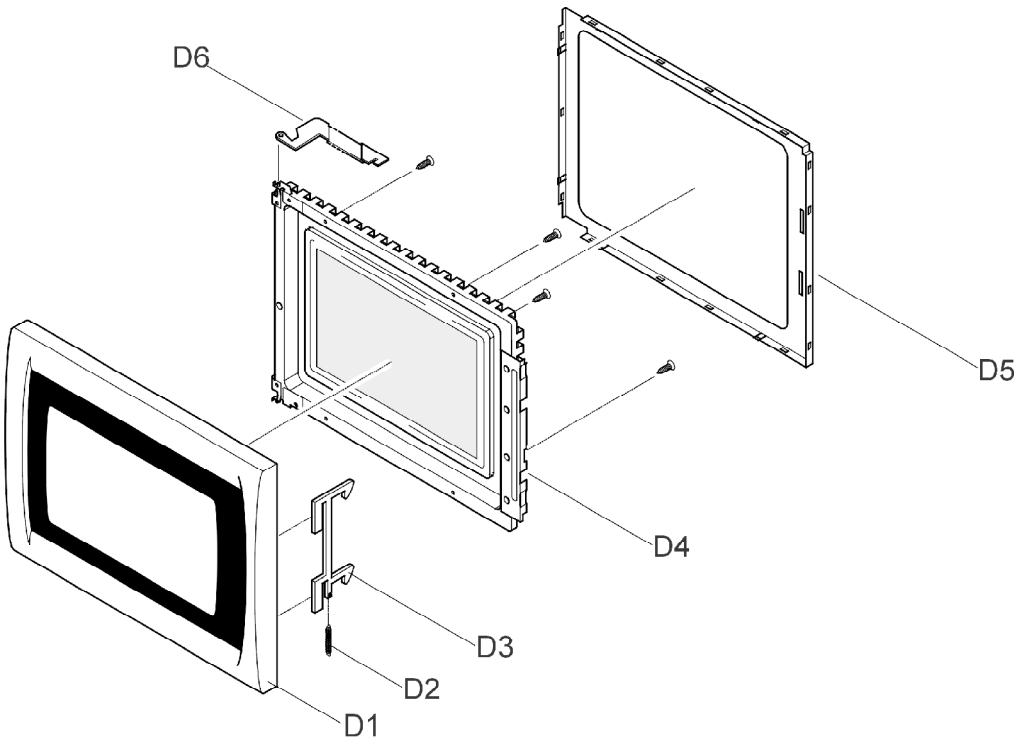
**Important safety notice**

**1. Components identified by! mark have special characteristics important for safety. When replacing any of these components, use only the manufacturers specified**

| Ref. No. | Part No. | Description | Qty | Remarks |
|---|---|---|---|---|
| | | | | |
| 1 | E00064080BP | WARNING LABEL | 1 | ⚠ |
| 2 | E41199000BP | EXHAUST GUIDE D | 1 | |
| 3 | E10589000BP | BACK PANEL COVER | 1 | |
| 4 | E605A4V20BP | THERMISTER | 1 | ⚠ |
| 5 | AEE9108A20GN | HOLDER (P CLIP) | 1 | |
| 6 | E900C4V20BP | POWER CORD SUPPLY | 1 | ⚠ |
| 7 | E67597550GP | FUSE 10A | 1 | ⚠ |
| 8 | E607X4V20BP | NOISE FILTER | 1 | ⚠ |
| 9 | E400A4760JP | FAN MOTOR | 1 | ⚠ |
| 10 | AEE6230P10GN | FUSE 16A | 1 | ⚠ |
| 11 | E09020000AP | CUSHION RUBBER | 1 | |
| 12 | E22369000BP | RIGHT HEATER PANEL | 1 | |
| 13 | E41444V20GP | ORIFICE | 1 | |
| 14 | E40086430GP | FAN | 1 | |
| 15 | E030A4V20BP | LEAD WIRE | 1 | ⚠ |
| 16 | E41739000BP | SHUTTER FLAP | 1 | |
| 17 | E09620000AH | CUSHION RUBBER | 2 | |
| 18 | E63268960JP | MOTOR | 1 | ⚠ |
| 19 | E41749000BP | SHUTTER PIN | 1 | |
| 20 | E400E9000BP | AIR GUIDE | 1 | |
| 21 | E48236750BP | CAM A | 1 | |
| 22 | E61425180AP | SHUTTER SWITCH | 1 | ⚠ |
| 23 | E22439000BP | ADIABATIC MATERIAL A | 1 | |
| 24 | E40474V00BP | AIR GUIDE E | 1 | |
| 25 | E09020000AK | CUSHION RUBBER | 1 | |
| 26 | E40309000GP | AIR GUIDE D | 1 | |
| 27 | E030E4V20BP | HV LEAD WIRE | 1 | ⚠ |
| 28 | E606Y4V20GP | INVERTER | 1 | ⚠ |
| 29 | E66014V00BP | INVERTER EARTH BRACKET | 1 | ⚠ |
| 30 | E65854V00BP | INVERTER SUPPORT BRACKET | 1 | |
| 31 | E01214V20BP | ADAPTOR PLATE | 1 | |
| 32 | E610T6700BP | OVEN LAMP | 1 | ⚠ |
| 33 | E31374830AP | HOOK SPACER B | 1 | |
| 34 | E31384830AP | HOOK SPACER C | 1 | |
| 35 | E61425180AP | SECONDARY LATCH SWITCH | 1 | ⚠ |
| 36 | E61785180AP | SHORT SWITCH | 1 | ⚠ |
| 37 | AEE6142-1450 | PRIMARY SWITCH | 1 | ⚠ |
| 38 | E30208000BP | DOOR HOOK A | 1 | |
| 39 | E11088020BP | FIBRE WASHER | 4 | |
| 40 | E09020000AL | CUSHION RUBBER | 1 | |
| 41 | E09020000ED | CUSHION RUBBER | 1 | |
| 42 | 2M236-M1G | MAGNETRON | 1 | ⚠ |
| 43 | E610U9000BP | THERMAL CUTOUT ASSY | 1 | ⚠ |
| 44 | XTWANE4+12B | SCREW | 4 | |
| 45 | E10019000GP | BASE PLATE | 1 | |
| 46 | E16079000BP | DRIP TRAY | 1 | |
| 47 | E21449000BP | SELF CLEAN.PANEL | 1 | |

| Ref. No. | Part No. | Description | Qty | Remarks |
|---|---|---|---|---|
| 48 | AEE6418Z70BP | HEATER SUPPORT | 2 | |
| 49 | E63268960JP | TURNTABLE MOTOR | 1 | |
| 50 | AEE1008-5S1 | RUBBER FOOT | 4 | |
| 51 | E630G9000BP | GRILL HEATER | 1 | ⚠ |
| 52 | AEE2177-F80 | PULLEY SHAFT WASHER | 1 | |
| 53 | E21315870GP | PULLEY SHAFT | 1 | |
| 54 | E30076700AP | HINGE B | 1 | |
| 55 | XSN4+6ZS | SCREW | 1 | |
| 56 | E20559000BP | COVER A | 1 | |
| 57 | E200A4V20BP | OVEN CAVITY | 1 | |
| 58 | E09030000CD | CUSHION RUBBER | 1 | |
| 59 | E22589000BP | ADIABATIC MATERIAL | 1 | |
| 60 | E22379000BP | LEFT HEATER PANEL | 1 | |
| 61 | E030H9000BP | HUMIDITY SENSOR | 1 | ⚠ NN-A880WB |
| 62 | E40249000GP | EXHAUST GUIDE A | 1 | |
| 63 | E202N9000BP | UPPER HEATER COVER | 1 | |
| 64 | E64179000BP | HEATER BRACKET A | 1 | |
| 65 | E67579000BP | HEATER BRKT D | 1 | |
| 66 | E630H9000BP | CONVECTION HEATER | 1 | ⚠ |
| 67 | E64189000BP | HEATER BRACKET B | 1 | |
| 68 | E607F9000BP | HEATER COVER | 1 | |
| 69 | E22429000BP | ADIABATIC MATERIAL | 1 | |
| 70 | E20339000BP | HEATER COVER B | 1 | |
| 71 | E41079000GP | EXHAUST GUIDE B | 1 | |
| 72 | E09230000AQ | CUSHION RUBBER | 1 | |
| 73 | E490S8020GP | CONV MOTOR | 1 | ⚠ |
| 74 | E22399000BP | CIRCUALTION FAN | 1 | |
| 75 | E110D4V30HBP | OUTER PANEL | 1 | NN-A880WB NN-A850WB |
| 75 | E110D4V30BP | OUTER PANEL | 1 | NN-A850CB |
| 76 | E01507550BP | WARNING LABEL | 1 | ⚠ NN-A880WB NN-A850WB |
| 76 | E01507560BP | WARNING LABEL | 1 | ⚠ NN-A850CB |

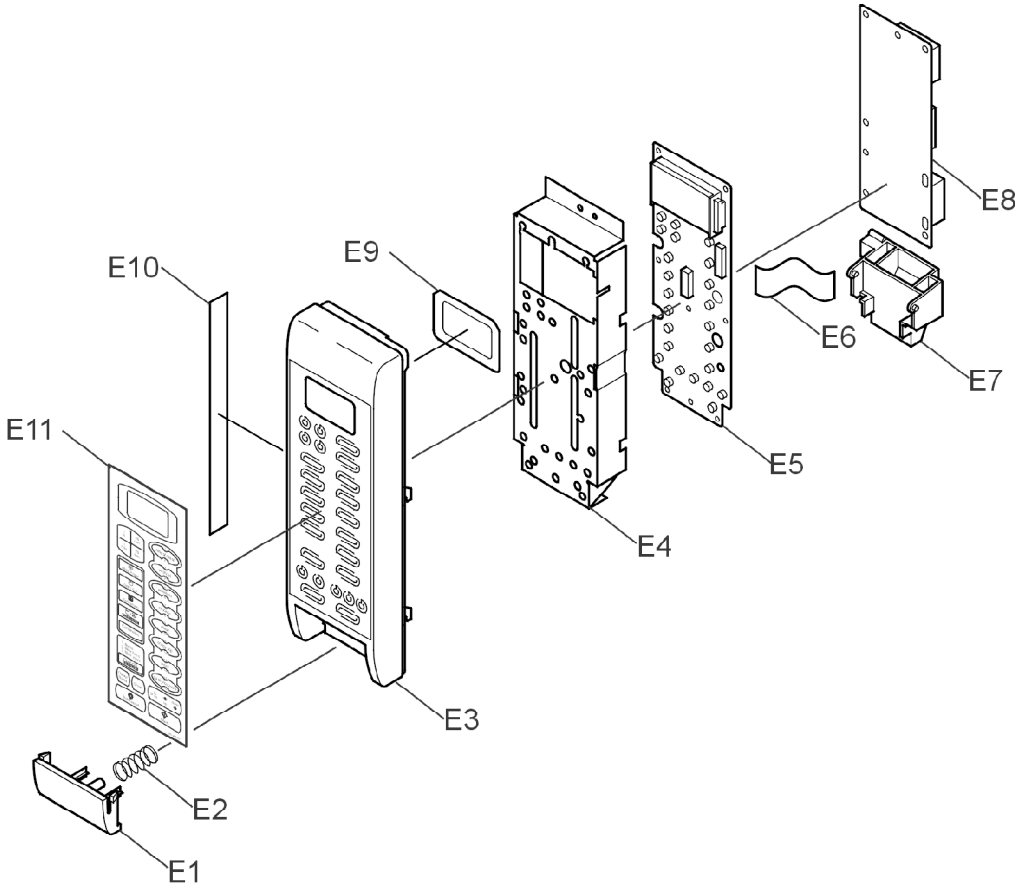
# 16. Door Assembly




| Ref | | Part | Description | Qty | Remarks |
|---|---|---|---|---|---|
| D1 | | E302A4V20HBP | DOOR A ASSYM | 1 | NN-A880WB NN-A850WB |
| D1 | | E302A4V20BP | DOOR A ASSYM | 1 | NN-A850CB |
| D2 | | E30214000AP | DOOR KEY SPRING | 1 | |
| D3 | | E30188000BP | DOOR KEY A | 1 | |
| D4 | | E302K9000BP | DOOR E | 1 | ⚠ |
| D5 | | E30859000BP | DOOR C | 1 | |
| D6 | | E30067300AP | HINGE | 1 | |

**When ordering any door component also order door C, this part may become damaged during dissassembly of the door.**

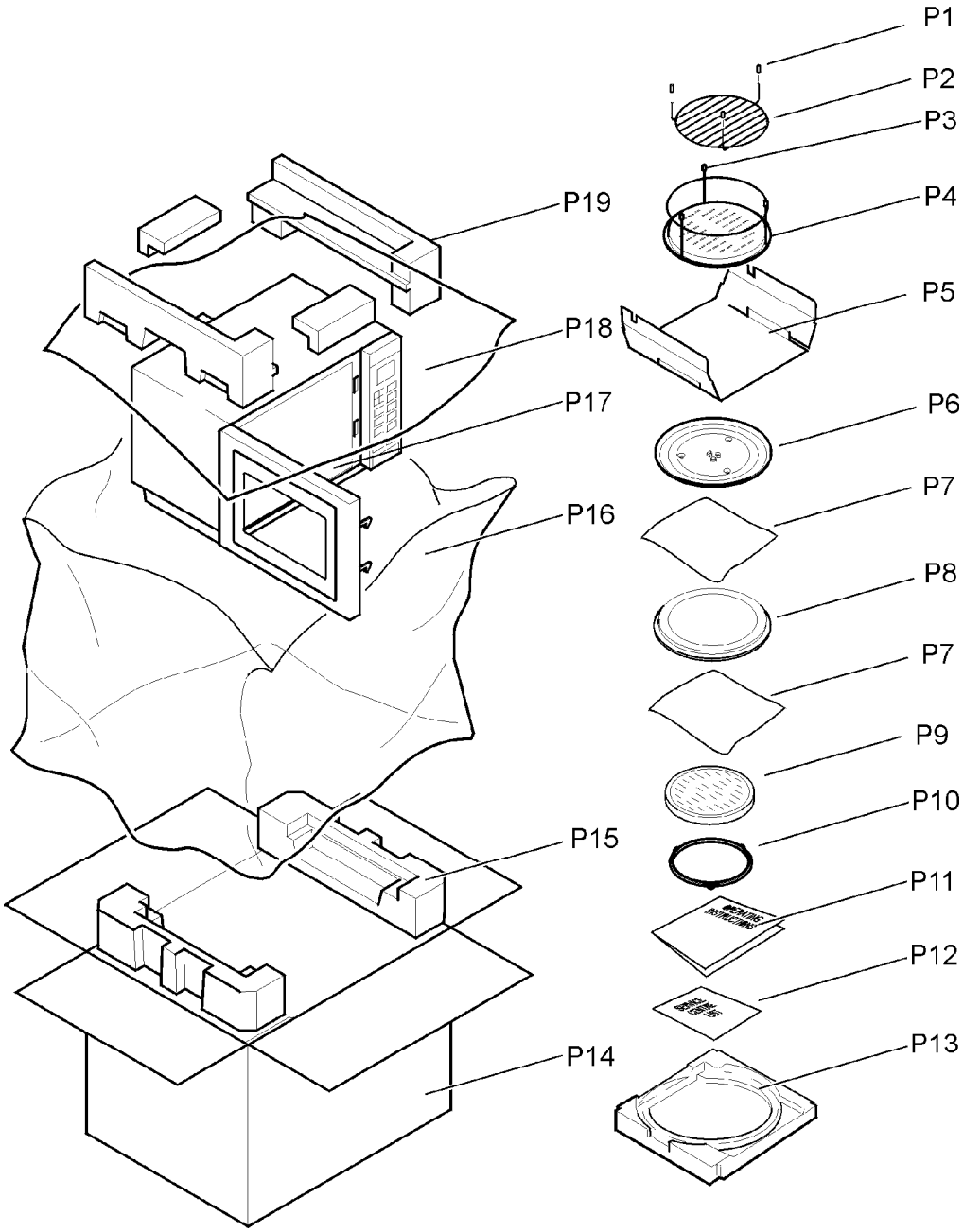
# 17. Escutcheon Base Assembly




| Ref. No. | | Part | Description | Qty | Remarks |
|---|---|---|---|---|---|
| E1 | | E80724V20HBP | DOOR OPENING BUTTON | 1 | NN-A880WB NN-A850WB |
| E1 | | E80724V20BP | DOOR OPENING BUTTON | 1 | NN-A850CB |
| E2 | | E80378A0AG | SPRING | 1 | |
| E3 | | E80344V20HBP | ESCUTCHEON BASE | 1 | NN-A880WB NN-A850WB |
| E3 | | E80344V20BP | ESCUTCHEON BASE | 1 | NN-A850CB |
| E4 | | E81274V20BP | ESC BACK PLATE | 1 | |
| E5 | | E603L4V20BP | P C B AU | 1 | ⚠ NN-A880WB |
| E5 | | E603L4V30BP | P C B AU | 1 | ⚠ NN-A850WB NN-A850CB |
| E6 | | E6629-1600 | RIBBON CABLE | 1 | |
| E7 | | E82564V20BP | DOOR OPENING LEVER | 1 | |
| E8 | | E603Y4V20BP | P C B DU | 1 | ⚠ NN-A880WB |
| E8 | | E603Y4V30BP | P C B DU | 1 | ⚠ NN-A850WB NN-A850CB |
| E9 | | E83264V20BP | DISPLAY SHEET | 1 | |
| E10 | | E00074V30BP | NAME PLATE | 1 | |
| E11 | | E83374V20HBP | ESCUTCHEON SHEET | 1 | NN-A880WB |
| E11 | | E83374V30HBP | ESCUTCHEON SHEET | 1 | NN-A850WB |
| E11 | | E83374V30BP | ESCUTCHEON SHEET | 1 | NN-A850CB |

**When ordering the escutchoen base also order the name plate**

# 18. Packing And Accessories

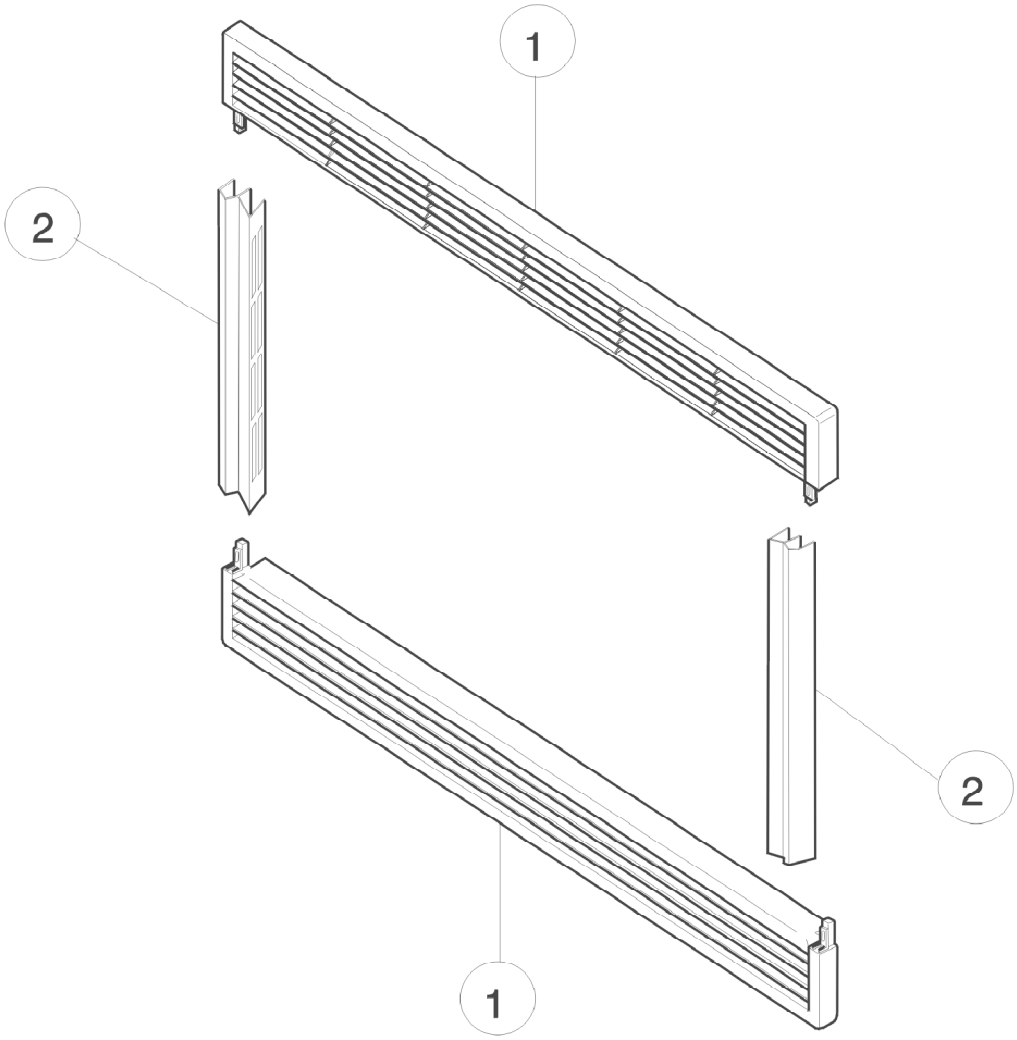

P1
P2
P3
P4
P5
P6
P7
P8
P7
P9
P10
P11
P12
P13
P14
P15
P16
P17
P18
P19

| Ref | Part | Description | Qty | Remarks |
|---|---|---|---|---|
| P1 | E06435870GS | RUBBER FOOT (RED) | 3 | |
| P2 | E060V8020BP | WIRE RACK LOW | 1 | |
| P3 | E06435870SP | RUBBER FOOT (BLACK ) | 3 | |
| P4 | E060V6520BP | WIRE RACK HIGH | 1 | |
| P5 | E01089000BP | TRAY PACKING | 1 | |
| P6 | E06014N30BP | GLASS TRAY | 1 | ⚠ |
| P7 | E0212-1520 | FOAM SHEET | 1 | |
| P8 | E06015020GP | ENAMEL TRAY | 1 | |
| P9 | E06485020AP | SPLATTER TRAY | 1 | |
| P10 | E290D5850GP | ROLLER RING | 1 | |
| P11 | E00034V20BP | OPERATING INSTRUCTIONS/COOKBOOK | 1 | |
| P12 | E01695750BP | SERVICE LIST | 1 | |
| P13 | E01136700BP | TRAY STYROL | 1 | |
| P14 | E01024V20HBP | CARTON BOX | 1 | NN-A880WB |
| P14 | E01024V30HBP | CARTON BOX | 1 | NN-A850WB |
| P14 | E01024V30BP | CARTON BOX | 1 | NN-A850CB |
| P15 | E01059000BP | LOWER FILLER | 1 | |
| P16 | E01069000BP | COVER POLYTHENE | 1 | |
| P17 | E01079000BP | DOOR SHEET | 1 | |
| P18 | E01926430GP | PROTECTOR SHEET | 1 | NN-A850CB |
| P19 | E01049000BP | UPPER FILLER | 1 | |

# 19. REF No 8 E607X4V20BP Noise Filter (U)

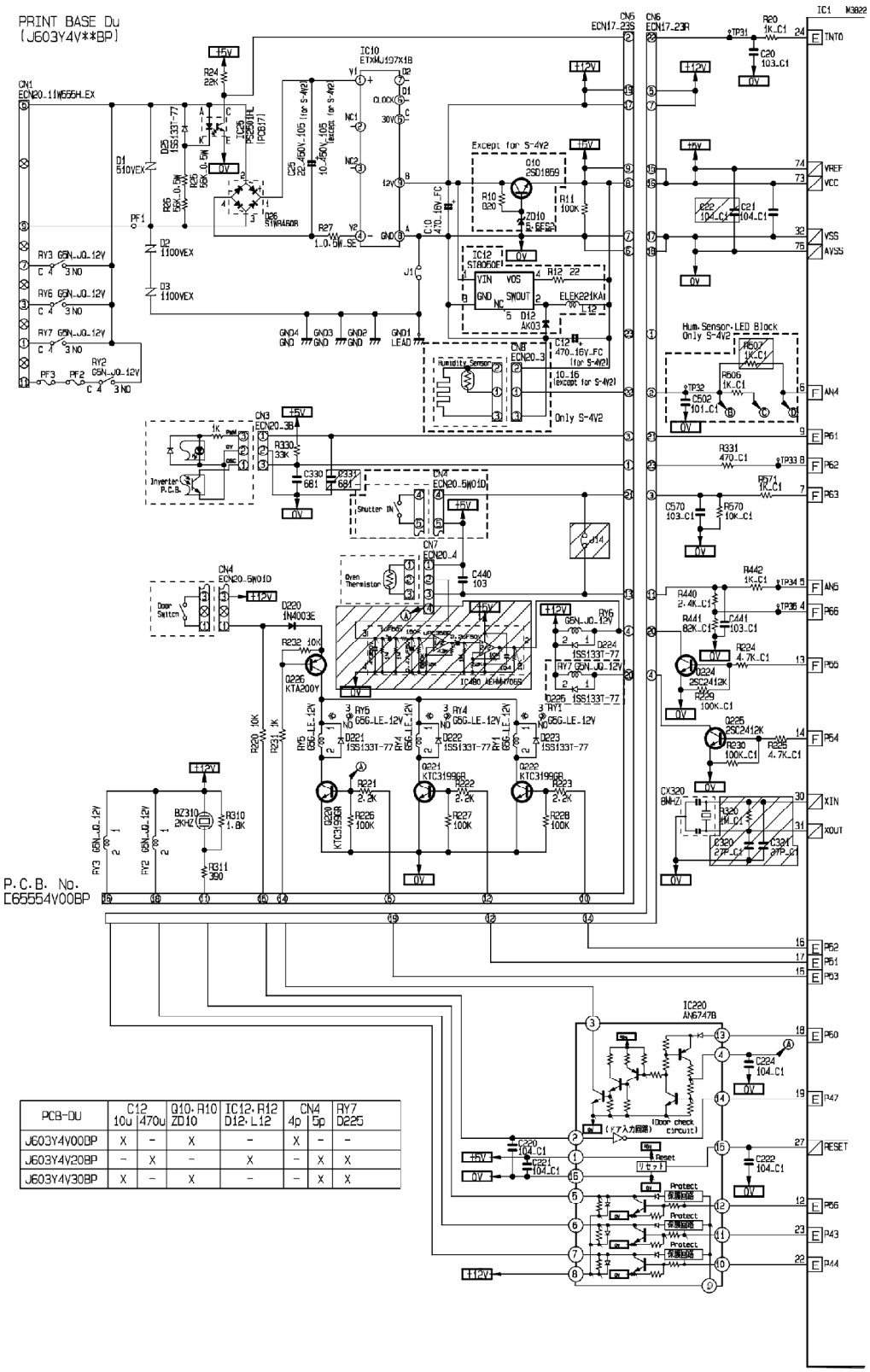
| Ref No | Part No. | Description | Qty | Remarks |
|---|---|---|---|---|
| R1 | ERG1SJ753P | Resistor | 1 | 75K Ω W |
| C1 & C2 | QETJ5225KRP2CE | Capacitor | 2 | 2.2 μ F |
| C3 & C4 | ECKMNA472ME | Capacitor | 2 | 4700pF 250V AC |
| L1 | SC-08-E203A | Inductor | 1 | 2.4mH |
| F1 | E62316010BP | Fuse Holder | 2 | |

# 20. Parts List For Microwave Oven Trim Kits

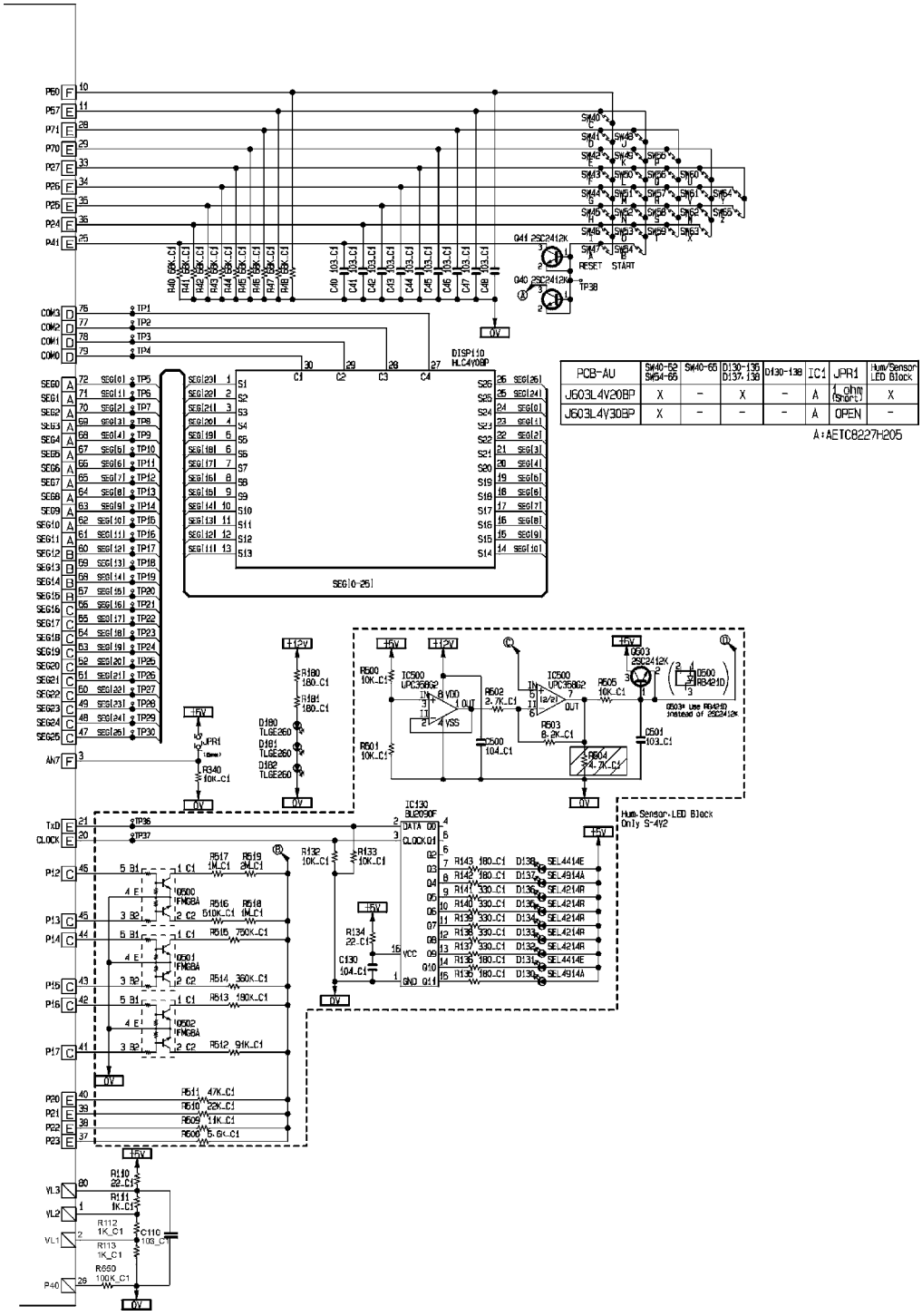



| Trim Model Number | Top And Bottom Strip REF No 1 | Set | Side strip REF No 2 | Set | Microwave Oven Model Number |
|---|---|---|---|---|---|
| NN-TKA80W | E1603A510HBP | 1 | E1601A540HBP | 1 | NN-A880WB NN-A850WB |
| NN-TKA80C | E1603A510BP | 1 | E1601A540BP | 1 | NN-A850CB |
| Instalation Guide | | | A0003A810BP | | |

# 21. Digital Programmer Circuit Schematic



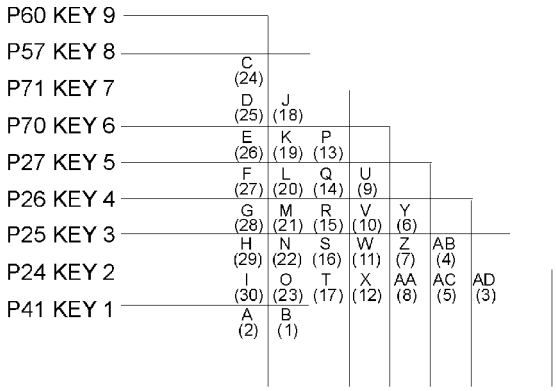

| PCB-DU | C12 10u | C12 470u | Q10・R10 ZD10 | IC12・R12 D12・L12 | CN4 4p | CN4 5p | RY7 D225 |
|---|---|---|---|---|---|---|---|
| J603Y4V00BP | X | – | X | – | X | – | – |
| J603Y4V20BP | – | X | – | X | – | X | X |
| J603Y4V30BP | X | – | X | – | – | X | X |

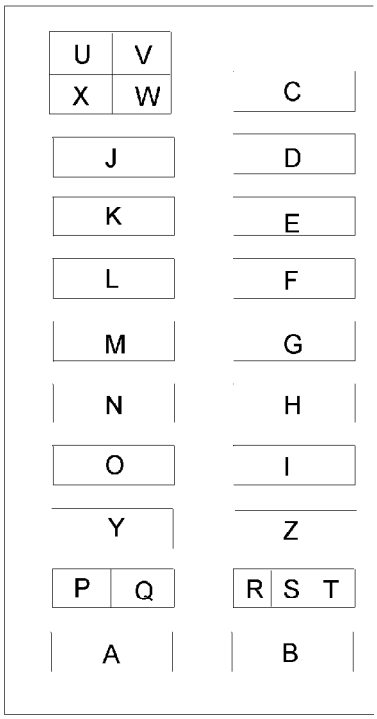


| PCB-AU | SW40-52 SW54-65 | SW40-65 | D130-136 D137-136 | D130-138 | IC1 | JPR1 | Hum/Sensor LED Block |
|---|---|---|---|---|---|---|---|
| J603L4V20BP | X | - | X | - | A | 1 ohm (short) | X |
| J603L4V30BP | X | - | - | - | A | OPEN | - |

A:AETC8227H205

# 22. Key Board Matrix




| | |
|---|---|
| B(1) | START |
| A(2) | RESET |
| AA(3)<br>AB(4) | |
| AC(5) | |
| Y(6)<br>Z(7)<br>AD(8) | AUTO (W DEF)<br>AUTO |
| U(9)<br>V(10) | 1HOUR<br>10 MIN |
| W(11) | 10 SEC |
| X(12) | 1 MIN |
| P(13)<br>Q(14)<br>R(15)<br>S(16)<br>T(17) | STAND<br>CLOCK<br>LB/OZ<br>UP<br>DOWN |
| J(18) | POWER |
| K(19)<br>L(20)<br>M(21) | GRILL<br>CONVECTION<br>GRILL CONV |
| N(22)<br>O(23) | COMBINATION |
| C(24)<br>D(25) | AUTO<br>AUTO |
| E(26) | AUTO |
| F(27) | AUTO |
| G(28) | AUTO |
| H(29) | AUTO |
| I(30) | AUTO |

# 23. Digital Programmer Circuit Parts

## 23.1. E603L4V20BP E603L4V30BP DPCAU

| Reference | | Part Number | Description | J603L 4V20BP | J603L 4V30BP |
|---|---|---|---|---|---|
| C502 | | AECU1F101J50 | 100pF Chip Capacitor | 1 | 0 |
| C40-C48 C110 C20 C441 C570 | | AECU1F103Z50 | 10nF Chip Capacitor | 13 | 13 |
| C501 | | AECU1F103Z50 | 10nF Chip Capacitor | 1 | 0 |
| C220 C221 C222 C224 C21 | | AECU1F104Z25 | 100nF Chip Capacitor | 5 | 5 |
| C130, C500 | | AECU1F104Z25 | 100nF Chip Capacitor | 2 | 0 |
| R111-R113 R20 R442 R571 | | AERJ3GSYJ102 | 1K Chip Resistor | 6 | 6 |
| R506 | | AERJ3GSYJ102 | 1K Chip Resistor | 1 | 0 |
| R132,R133,R570 | | AERJ3GSYJ103 | 10K Chip Resistor | 3 | 3 |
| R500,R501,R505 | | AERJ3GSYJ103 | 10K Chip Resistor | 3 | 0 |
| R650,R229,R230 | | AERJ3GSYJ104 | 100K Chip Resistor | 3 | 3 |
| R517,R518 | | AERJ3GSYJ105 | 1M Chip Resistor | 2 | 0 |
| R340 | | AERJ3GSYJ103 | 10K Chip Resistor | 1 | 1 |
| R509 | | AERJ3GSYJ113 | 11K Chip Resistor | 1 | 0 |
| R180,R181 | | AERJ3GSYJ181 | 180 Chip Resistor | 2 | 2 |
| R135 R136 R142 R143 | | AERJ3GSYJ181 | 180 Chip Resistor | 4 | 0 |
| R513 | | AERJ3GSYJ184 | 180K Chip Resistor | 1 | 0 |
| R519 | | AERJ3GSYJ205 | 2M Chip Resistor | 1 | 0 |
| R110 | | AERJ3GSYJ220 | 22 Chip Resistor | 1 | 1 |
| R134 | | AERJ3GSYJ220 | 22 Chip Resistor | 1 | 0 |
| R510 | | AERJ3GSYJ223 | 22K Chip Resistor | 1 | 0 |
| R440 | | AERJ3EKF2401 | 2.40K Chip Resistor 1% | 1 | 1 |
| R502 | | AERJ3GSYJ272 | 2.7K Chip Resistor | 1 | 0 |
| R137-R141 | | AERJ3GSYJ331 | 330 Chip Resistor | 5 | 0 |
| R514 | | AERJ3GSYJ364 | 360K Chip Resistor | 1 | 0 |
| R331 | | AERJ3GSYJ471 | 470 Chip Resistor | 1 | 1 |
| R224,R225 | | AERJ3GSYJ472 | 4.7K Chip Resistor | 2 | 2 |
| R511 | | AERJ3GSYJ473 | 47K Chip Resistor | 1 | 0 |
| R516 | | AERJ3GSYJ514 | 510K Chip Resistor | 1 | 0 |
| R508 | | AERJ3GSYJ562 | 5.6K Chip Resistor | 1 | 0 |
| R40-R48 | | AERJ3GSYJ683 | 68K Chip Resistor | 9 | 9 |
| R515 | | AERJ3GSYJ754 | 750K Chip Resistor | 1 | 0 |
| R503 | | AERJ3GSYJ822 | 8.2K Chip Resistor | 1 | 0 |
| R441 | | AERJ3EKF8202 | 82.0K Chip Resistor 1% | 1 | 1 |
| R512 | | AERJ3GSYJ913 | 91K Chip Resistor | 1 | 0 |
| Q503 | | AESSRB421D | Shottky diode | 1 | 0 |
| Q40 Q41 Q224 Q225 | | 2SC2412KT146 | NPN Transistor | 4 | 4 |
| Q500-Q502 | | AESCFMG8AE | Dual NPN Digi-Tr | 3 | 0 |
| IC500 | | AEICUPC358G2 | OP-AMP | 1 | 0 |
| IC130 | | AEICBU2090F | IC (Serial-Parallel) | 1 | 0 |
| IC1 | ! | AEIC8227H205 | LSI M3822 (32K) | 1 | 1 |
| CX320 | | EFOMC8004T4 | Ceramic Resonator | 1 | 1 |
| SW40-52 SW54-65 | | EVQ11L05R | Push Switch | 25 | 25 |
| D132-D135 | | AELN4214R | RED LED (Diffused) | 4 | 0 |
| D131,D138 | | AESQSEL4414E | GREEN LED (Clear) | 2 | 0 |
| D130,D137 | | AESQSEL4914A | ORANGE LED (Clear) | 2 | 0 |
| D180-D182 | | AESQTLGE260T | Green LED (backlight) | 3 | 3 |
| DISP110 | | AEDDHL4V00BP | LCD | 1 | 1 |
| | | A611A4J01XN | Display Holder Unit | 1 | 1 |
| IC220 | | AN6747B | Custom IC | 1 | 1 |
| CN6 | | AEEM23FESVKN | CONNECTOR | 1 | 1 |
| JPR1 | | ERDS2TJ1R0T | 1 ohm Carbon Resistor | 1 | 0 |

## 23.2. E603Y4V20BP E603Y4V30BP DPC DU

| Reference | | Part Number | Description | J603Y 4V20BP | J603Y 4V30BP |
|---|---|---|---|---|---|
| ZD10 | | AESZMTZ5R6B | Zener Diode | 0 | 1 |
| D221-D225 | | AESS133T-77 | Silicon Diode | 5 | 5 |
| D25 | | AESS133T-77 | Silicon Diode | 1 | 1 |
| D220 | | AESS1N4003E | Silicon Diode | 1 | 1 |
| D12 | | AESSAK03 | Shottky Diode | 1 | 0 |
| C330 | | ECBT1H681KB5 | 680PF Capacitor | 1 | 1 |
| C331 | | ECBT1H681KB5 | 680PF Capacitor | 0 | 0 |
| C440 | | ECBT1E103ZF5 | 10nF Capacitor | 1 | 1 |
| R25,R26 | | ERDS1FJ563T | 56K 1/2 Watt Resistor | 2 | 2 |
| R220,R232 | | ERDS2TJ103T | 10K Resistor | 2 | 2 |
| R11,R226-R228 | | ERDS2TJ104T | 100K Resistor | 4 | 4 |
| R12 | | ERDS2TJ220T | 22 Resistor | 1 | 0 |
| R231 | | ERDS2TJ102T | 1.0K Resistor | 1 | 1 |
| R221-R223 | | ERDS2TJ222T | 2.2K Resistor | 3 | 3 |
| R24 | | ERDS2TJ223T | 22K Resistor | 1 | 1 |
| R330 | | ERDS2TJ333T | 33K Carbon Resistor | 1 | 1 |
| R311 | | ERDS2TJ391T | 390 Resistor | 1 | 1 |
| R10 | | ERDS2TJ821T | 820 Resistor | 0 | 1 |
| R310 | | ERSD2TJ182T | 1.8K Resistor | 1 | 1 |
| Q10 | | 2SD1859TV2 | Transistor | 0 | 1 |
| Q226 | | AESAKTA200Y | PNP Transistor | 1 | 1 |
| Q220-Q222 | | AESCKTC3199GR | NPN Transistor | 3 | 3 |
| C10 | | EEUFC1C471B | 470uF 16 V Elect Capa | 1 | 1 |
| C12 | | EEUFC1C471B | 470uF 16 V Elect Capa | 1 | 0 |
| C12 | | ECEA1CKA100B | 10uF 16V Electrolytic Capacitor | 0 | 1 |
| R27 | | ERX12SJ1R0E | 1R 1/2 Watt Resistor | 1 | 1 |
| L12 | | ELEKN221KA | 220uH | 1 | 0 |
| CN3 | | AEEMXF00703B | 3 Pin Connector (Inverter) | 1 | 1 |
| CN8 | | AEEMMF00703W | 3 Pin Connector (Figaro Sensor) | 1 | 0 |
| CN7 | | AEEMMF00703R | 3 Pin Connector (OvenThermistor) | 1 | 1 |
| CN4 | | AEEMXF01D05W | 5 Pin Connector | 1 | 1 |
| C25 | | A6219-1850 | Capacitor Cover (small) | 0 | 1 |
| C26 | | A62194J00XN | Capacitor Cover (large) | 1 | 0 |
| RY2 RY3 RY6 RY7 | | AEBGG5N1A12 | 12 V Relay | 4 | 4 |
| RY1,RY4,RY5 | | AEGG5G1A12 | 12 V Relay | 3 | 3 |
| CN5 | | AEEM23FEBVKN | 23 Pin Connector | 1 | 1 |
| CN5 | | AEEM19FEBVKN | 19 Pin Connector | 0 | 0 |
| CN1 | | AEEMXD55511W | 11 Pin Connector | 1 | 1 |
| IC25 | | AEICP25011HL | Photocoupler IC | 1 | 1 |
| D26 | | AESTS1WBA60B | Diode Bridge (600V) | 1 | 1 |
| IC12 | | AEICSI8050E | IC (DC-DC conveter) | 1 | 0 |
| C25 | | ECA2WHG100E | 10uF 450V Electrolytic Capacitor | 0 | 1 |
| C25 | | ECA2WHG220E | 22uF 450V Electrolytic Capacitor | 1 | 0 |
| BZ310 | | EFBAH20C001 | 2KHz Buzzer | 1 | 1 |
| D2,D3 | | ERZV10D112C1 | Varistor 1100V | 2 | 2 |
| D1 | | ERZV10D511CS | Varistor 510V | 1 | 1 |
| IC10 | | ETXMJ197X1BG | Switching Power Supply | 1 | 1 |